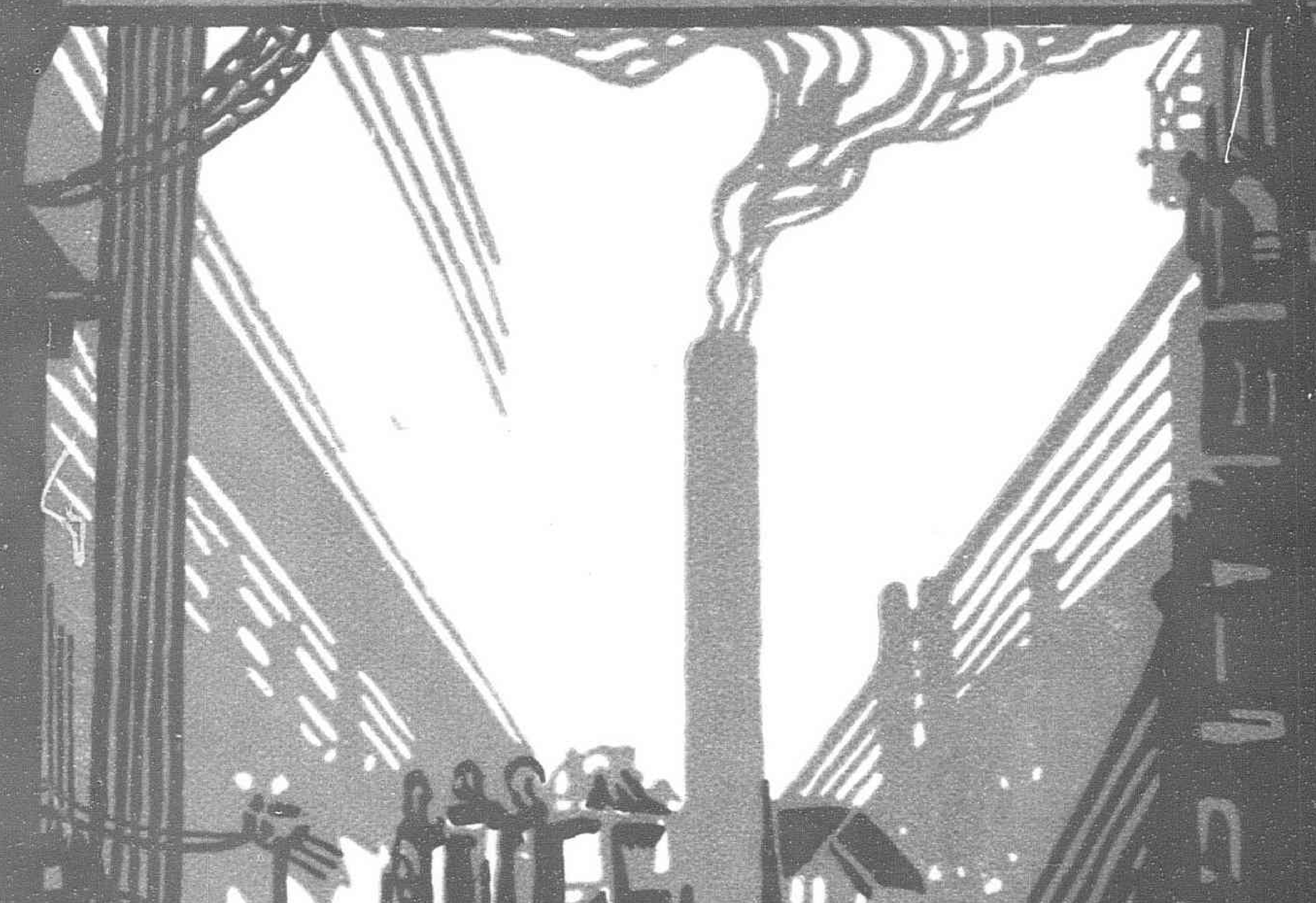
THE FAR EASTERN REVIEW

FOUNDED BY GEORGE BRONSON REA
35TH YEAR OF PUBLICATION



遠東時報

上海黃浦灘念四號

INDO-CHINA IN THE PATH OF JAPANESE EXPANSION

THE TRUTH ABOUT RESISTANCE

THE NEW SHANGHAI OF THE FUTURE

Vol. XXXV

JUNE, 1939

No. 6

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ENGINEERING FINANCE COMMERCE

VOL. XXXV SHANGHAI, JUNE, 1939 No. 6

FAR EASTERN CROSS-CURRENTS

THE hourly capacity of 2,500 persons of the General Electric Company's two auditoriums at the New York World's Fair proved inadequate to satisfy the popularity of Steinmetz Hall and the House of Magic with the fair's opening day crowds.

So eager were the fair's visitors to discover the source of the " big noise " emanating from Steinmetz Hall that one of the doors was forced open. J. O. Wetherbie, director of the exhibit, finally summoned 14 detectives to help handle the waiting lines of people.

From early in the afternoon until the 10 o'clock closing hour, hundreds of people stood in lines leading to the doors of the House of Magic and the man-made lightning auditorium. The House of Magic theater seats 350 at present and others stood to see the show through every performance. Steinmetz Hall attracted 600 people for every show.

The various features of the exhibit area also drew crowds all day, but most in demand were the television studio and the booths for television receivers. When President Roosevelt's speech was televised, the television booths over-flowed with a solid jam of spectators.

" Best show on the grounds " was the comment most frequently heard as the visitors poured out of Steinmetz Hall after seeing and hearing 10,000,000-volts of man-made lightning.

Expecting that most of the opening day's visitors would confine themselves to a tour of the grounds, the G.E. exhibit directors were unprepared for the rush. Ushers and lecturers passed up lunch and dinner to carry out their continuous showings.

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Extraordinary precautions have been taken lately by the Shanghai municipal police and the British military authorities to guard the safety of Sir Archibald Clark Kerr, H.M. British Ambassador, who has been one of those to receive threatening letters. Special guards have been placed both at the British Embassy, 27 The Bund and at the Ambassador's residence 50 Tunsin Road.

Sir Archibald has been prevailed upon to wear a steel-vest whilst on his way through Shanghai streets and seemed rather hindered by the protective garb. The vest he is wearing is of the type which can stop even high velocity Mauser bullets, whilst his escort of foreign detectives wears the lighter variety.

It was also understood that a new car for the Ambassador is at present being built locally and that it will be bullet-proof. It is believed that when this vehicle will be put into use the large numbers of police officers accompanying him will be considerably reduced, although an identical number of men will remain stationed both at the Embassy and at his residence.

Whilst official confirmation is lacking, it was understood that the Ambassador's life was not being directly threatened and that no intimidation had taken place, but that information has been received to the effect that an attempt on his life was being planned.

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The Shibaura Engineering Works, of Tokyo, and the United Engineering and Foundry Company, of Pittsburgh, Pennsylvania, have agreed formally on the establishment of a Y16,000,000 company in Tokyo for the manufacture of rolling mill equipment.

Negotiations were completed in Tokyo by Mr. Kisaburo Yamaguchi, Chairman of the Board of Directors of the Shibaura Engineering Works and Mr. George Ladd, President of the United Engineering and Foundry Company, who arrived in Tokyo early in June with Mr. John L. Young, Manager of the concern's machinery sales division. The deal completed, the two Americans sailed for the United States aboard the *Kamakura Maru*.

The new concern, the Shibaura-United Engineering Company, Limited, will manufacture rolling mill equipment for Japan, Manchoukuo and China, said Mr. Ladd. Active management will be in the hands of Mr. Yamaguchi and the staff of the Shibaura works, which owns 51 per cent of the stock. The Americans will have two representatives on the Board of Directors, Mr. Ladd and Mr. Charles Muchnic, foreign sales representative of the American concern. The United Engineering and Foundry Company will also have a representative on the spot.

The bulk of the United Engineering and Foundry Company's Y7,840,000 investment (49 per cent of the stock) will be in the form of rolling mill machinery furnished from its American plants of the firm, which is the world's largest producer of rolling mill machinery.

The remainder of the American investment, explained Mr. Ladd, will be in the form of technical assistance. On hand already is one designing engineer. Operators are scheduled to arrive about the first of the year, such men as shop superintendents and skilled machine tool operators, who will spend much of their time teaching the Japanese workmen how to use the new and unfamiliar equipment.

Machinery shipments from the United States are expected to begin within the next month or so in order that the plant, which will be located at the Shibaura Engineering Works here, may be set up and begin operating sometime after the first of next year.

In general, the equipment will be sent from the Wooster, Ohio machine shop of the American company, and from other of its plants in which there is duplicate machinery.

The move is being made, said Mr. Ladd, to keep the Japanese business. " We have had a great deal of business with Japan in the past," he pointed out.

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The outcome of the present Sino-Japanese war is likely to be some sort of compromise affording temporary peace pending a renewal of the struggle later, according to Mr. Walter H. Mallory in the current issue of the magazine *Foreign Affairs* published recently.

The article, entitled " The Strategy of Chiang Kai-shek " says the Chinese Generalissimo has a consistent plan of resistance, much of which was formulated in detail before the outbreak of current hostilities. This strategy, said the article, was as follows :

(1) Remain on the defensive until the Japanese have been completely extended.

(2) Intensify guerilla fighting to keep the invaders occupied while the Chinese reorganize their armies.

(3) Launch a broad counter-offensive after the objectives of the first two steps have been accomplished.

The article said the Sino-Japanese war at present is in the second stage and predicted a major Chinese counter-offensive might never be possible unless more foreign aid is forthcoming to China. The article emphasized the importance to China of arousing her people to prolonged resistance.

In order to control China, said Mr. Mallory, Japan must also take the foreign concessions. Gen. Chiang would welcome such a move, the article said, because it would increase the chance of western aid to China.

In order to win the war, Mr. Mallory said, China must reorganize and strengthen her Army for counter-attack, or Japan must collapse at home.

In order for Japan to win, she must crush all military resistance, restore order in China and gain Chinese co-operation, Mr. Mallory said.

Since neither side seems capable of obtaining all their objectives, he predicts an eventual compromise and temporary peace.

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In a written reply in the House of Commons on June 9 to Sir Arnold Wilson, Conservative member for the Hitchin division of Hertfordshire, Lieut.-Colonel Muirhead, Under-Secretary of State for India and Burma, said that the proposals for a railway connection between Burma and Yunnan had been put before the Marquess of Zetland, Secretary of State for India and Burma, but had not been sufficiently specific to enable a decision to be taken.

All proposals for such a connection, he added, would of course receive the fullest consideration by military advisers to the British Government as well as the Governments of India and Burma.

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According to a United Press dispatch from Washington, Mr. Charles K. Moser, Far Eastern expert of the United States Department of Commerce, predicts that America will gradually regain her commercial power in the Orient. He said, moreover, that the United States is now more than holding its own in the competition with Japan for the Philippine market.

Mr. Moser said that the Sino-Japanese conflict had dealt a terrific blow both to American trade with China and with Japan. Trade with Japan has been especially hard hit in the last year, Mr. Moser said, declining 17 per cent from the preceding year.

Japan has not been having an easy time of it, the economist pointed out, due chiefly to the rising cost of production in a war-strained economy.

Japan's ambitions for developing a source in China for the raw materials she now imports from America is still only a dream, Mr. Moser declared. The passage of time will probably restore to American traders, he prophesied, free commercial access to the Far East and Far Eastern markets.

Analyzing the effects of the war on American-Chinese trade, Mr. Moser cited figures indicating that "exports of American products to China in 1938 were valued at under $35,000,000, the smallest export total recorded since 1916, and a decline of 30 per cent from 1937, and of nearly 26 per cent from 1936.

"Perhaps even more significant is the change that has taken place over those months in the relative position of the United States as compared with other countries participating in China's foreign trade, both export and import. Every year since 1930 we have held first place in that trade, until in 1938 when we relinquished it to Japan. Whereas in 1937 we sold China 20 per cent of its total imports, against 16 per cent from Japan, in 1938 our share was only 1 per cent while Japan's participation in China's imports advanced to 24 per cent."

Mr. Moser counseled against precipitate action to regain these markets. He said that the passage of time would probably adjust the present situation.

"I know," Mr. Moser said, "that to the trader, anxious to conserve his rights and collect his profits, this sort of philosophy is poor comfort. In his impatience he may falter in his faith in the destiny and resolution of our people. He may forget that the United States has traded with China over a far longer period than with any other nation; for more than 150 years; throughout, in fact, its whole life as a republic; and that in that time the people of the United States have traded freely on the other side of the Pacific in full equality with all others, and without limitations imposed by any that are not shared by all."

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The *Japan Advertiser* reports that the Finance Ministry has announced that all Foreign residents in Japan must report to the Finance Ministry between July 1 and July 5 all the gold coin, gold minerals and gold articles in their possession as of July 1 at noon.

Articles owned by foreigners, but temporarily in the care of banks or pawnbrokers, are likewise to be reported, the Ministry advises.

It is requested that those articles which have particular value as treasures or as curios, be specified as such in the forms which the Ministry is circulating.

Though the law provides that all residents in Japan (whether they be Japanese or foreigners) may be compelled to sell their gold to the Government, the official disclosed, authorities of the Ministry have not yet decided whether or not to apply this provision to foreign residents.

He pointed out, however, that in his personal opinion—which he made clear was by no means an official opinion—foreign residents will not be compelled to turn in their gold coins and gold articles. He suggested, in fact, that he thinks that foreign residents have nothing to worry about on that score.

The official suggested, however, that the Government will be very glad if foreign residents will co-operate by voluntarily bringing in their gold articles, which they can sell to the Finance Ministry at the rate of Y3.85 per gram of pure gold.

Articles which are to be reported are numerous and varied. In general, all articles whose gold content is seven carat or higher, and all articles containing gold or with gold ornament should be reported. Gold plated and gold filled articles, are not to be reported.

With the above reservations in mind, the following gold or partly gold articles are specially mentioned for report:

Ornaments such as rings, bracelets, cuff buttons, pen knives, and brooches.

Objects such as watches, spectacles, pipes, cigaret cases, spoons, paper knives and trophy cups.

Gold coins, both Western and Japanese, both ancient and modern, are to be listed in the report to the Finance Ministry. Holders of oban and koban, gold coins used in the Tokugawa Period, must report the number of each in their possession. Holders of American $10 gold pieces, for example, must report the number of each in their possession.

Persons with any gold nuggets on hand must report the number of nuggets and their combined weight.

Gold paper, such as that used for making signs on glass doors, gold pen points, gold badges, and gold needles for medical use need not be reported.

Articles containing very little gold, such as porcelains with designs painted in gold, lacquer ware and textiles with golden designs, folding screens, and, in general, articles which are merely gilded with gold need not be reported.

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According to a Reuter dispatch of June 19 from Chungking Chinese press reports that the Chinese Government will continue payment of principal and interest on domestic bonds secured on surplus of the Chinese Maritime Customs, such as the Consolidation (Fuhsing) and Gold (Kingchang) bonds, are denied by a spokesman of the Ministry of Finance.

The Chinese Government, he asserts, will not make payment of principal and interest on bonds secured on the Customs surplus, whether domestic or foreign.

The seventh drawing of the Consolidation Bonds, the spokesman states, will take place as usual on July 31, but no payment will be made.

It is possible for holders of coupons of drawn bonds to obtain loans from banks, using the coupons of drawn bonds as security.

Chinese press reports had stated that, in order to prevent large amounts of Chinese currency entering Japanese-controlled areas, payments would be made in Chungking, while payments in Shanghai would be made in the form of "remittance permits."

The payment falling due on July 31, it was added, totalled $56,603,500.

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Japanese were advised to abandon their sense of superiority over the Chinese, lest they repeat the "sins" of the white race in Asia.

This injunction was delivered by Viscount Mitsunojoy Funakoshi, one-time Ambassador to Germany before the World war, who said that Japanese maintaining such an attitude should be called "the destroyers" of the aims of the present campaign in China. The existence of such a sentiment, Viscount Funakoshi declared, would make meaningless the creation of a new order in East Asia.

The former diplomat urged the promotion of cultural activities that would co-ordinate the social, economic and political reconstruction of China, thereby assisting in dispelling Chinese mistrust of Japanese purposes.

The Chinese, he continued, should be impressed with the Orient's new mission in the world, which, Viscount Funakoshi said, could be attained only through co-operation between Japan, Manchoukuo and China.

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Reuter reports that "According to information in the hands of Lord Halifax, the Foreign Secretary, Hainan Island is only partially occupied, while there appears to have been no actual military occupation of the Spratley group of Islands by the Japanese."

This statement was made in the House of Commons on June 12 by Mr. R. A. Butler, Under-Secretary of State for Foreign Affairs, in reply to a question put by Mr. Wilfred Roberts, Labor Member for Northern Cumberland.

He added that the Government was keeping in close and constant touch with the French Government in the matter.

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Officials of the Japanese Cabinet Ministries concerned with the comings and goings of foreigners—presumably the Home Office, the Foreign Office and the Justice Ministry, are studying methods of interviewing foreign visitors without annoying them or causing them undue inconvenience, says Domei.

Since the outbreak of the China incident, vigilance over foreign tourists and residents who travel about the country has been increased considerably, as a necessary safeguard against espionage activities, it is pointed out. Regrettably, however, the work of alien supervision has not been properly co-ordinated and the policing agencies overlap. As a result, many foreigners are asked the same questions, over and over again, by different officers, when one properly conducted interview should be sufficient, the news agency says.

Of late the Foreign Office has received many complaints from foreigners who feel that they have been put through unnecessary ordeals. In one specific incidence, a traveler in Korea was questioned five times by officers while making a short trip by train. The questions asked were the same in all cases and the investigators were satisfied after each interview. The same man, after reaching Japan proper, was questioned twice between Shimonoseki and Tokyo.

Another source of irritation for foreigners concerns photography. Many have found themselves in trouble after unwittingly taking pictures in fortified zones. It is pointed out that policemen often stand by while amateur photographers snap forbidden pictures, unaware that they are violating regulations, and then arrest them after the act has been committed. In such cases, policemen should advise them beforehand to put away their cameras, the Cabinet officials believe.

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The Inner Mongolia Electric Industrial Company is planning to build a new 4,000-kilowatt power plant at Kowchuanchen, south-west of Tatung, in order to supply power for that city, which Domei says is expected to become one of the greatest industrial cities in Shansi Province in the near future.

Construction of the power plant, which is expected to cost in the neighborhood of Y60,000,000, will be started in July. It is expected to be completed by February of next year, according to a Tatung report to Domei.

Another electric power plant is expected to be completed next year at Shiuho, also near Tatung, at a cost of approximately Y7,000,000. The plant is scheduled to have a generating capacity of 15,000 kilowatts. It is said that the dynamo, which will be imported by the Okura Trading Company, will be of the latest type German make.

The Inner Mongolia Electric Industrial Company has a five-year plan for developing 100,000 kilowatts of power, of which 80,000 kilowatts will be available for Tatung.

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Returning from seven years in Far-Eastern waters, the little U.S.S. *Sacramento* put into port in New York on May 27 after an eventful five month cruise from Shanghai, covering 15,000 miles. Indifferent to the contrast to the sleek men o'war all around her, the *Sacramento* stood into its dock at the Brooklyn Navy Yard with Chinese sail made of rice bags rigged to her aft mast, much to the astonishment of watchers ashore.

Commander Jerome L. Allen, Captain of the ship, explained that he had been able to add two knots to the ship's eight-knot speed after he added the mainsail and foresail in Hongkong. The foresail was carried away at Manila but the sturdy, dumpy steamer used the wind bellowing the mainsail all the rest of the long way home via India, Suez, Naples, Gibraltar, Bermuda.

Also streaming from her foremast was her 137-feet-homeward-bound pennant, with its end almost whipping in the water. The ship's company of 12 officers and 184 men quickly shared after landing in cutting up the pennant for souvenirs, a star for every officer, a foot for every man, before setting out to get their land legs on New York's shore, and especially around Flushing Meadows, where the World Fair offers all kind of allure, educational and otherwise, for the home-coming gob. Some of the sailors seemed glad to see the New York skyline again, but not a few shook their heads sadly and confessed that they were already homesick for the China coast, "Me, I'm a China sailor," said one of them and all around him seemed to feel the same way.

The *Sacramento*, dubbed the "Galloping Ghost of the Orient" because of her peregrinations up and down the China Sea, was ordered prepared to go almost immediately to the scene of the Squalus submarine disaster to aid there in salvage operations. After that, where she will sail, indeed like a ghost of the old days of armoured navies, no one yet knew.

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With a view to ensuring self-sufficiency in raw cotton in the future, the Japanese Overseas Ministry has formulated a three-year cotton program aiming at annual cotton crops of 500,000,000 lb.

In accordance with the program, the Overseas Ministry has immediately taken the necessary steps to send 5,000,000 lb. of cotton seeds to Tsingtao, 1,500,000 lb. to Shansi, and 3,000,000 lb. to Tientsin, which will be distributed through the North China Cotton Cultivation Association to cotton growers.

The Ministry has further embarked upon the technical guidance of cotton cultivation in Central China, with Shanghai and Nanking as the center, and distributing approximately 1,000,000 lb. of cotton seeds through the newly-organized Cotton Cultivation and Improvement Society.—Reuter.

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Describing as groundless fears that Japan intends to restrict American opportunities in East Asia, Mr. Kensuke Horinouchi, Japanese Ambassador to the United States, during a speech at the Japan Day dinner on June 1 declared that the commercial doors of China are still open and will "swing wider to all interested nations in the years to come."

Addressing 1,500 persons assembled in the banquet hall of the Waldorf Astoria Hotel, Ambassador Horinouchi began his short address by congratualting the officials of the World Fair on the success of the exhibition.

Passing on to Japanese-American relations, Ambassador Horinouchi declared:

"I do not think it will take long to show how groundless are the fears that Japan intends to restrict American opportunities in East Asia.

"The commercial doors of China still are open and—so far as Japan is concerned—will swing wider to all interested nations in the years to come."

"Japan's only purpose," the Ambassador declared with reference to the current Sino-Japanese hostilities, "is to bring a measure of stability to her own part of the world and make it orderly, progressive and prosperous.

"The realization of this aim will be certain to raise American trade with Japan—and East Asia—to new levels of prosperity."

Pointing to the World's Fair motto to build a better world for to-morrow, Ambassador Horinouchi continued.

"For almost a century Japan and the United States have worked together as partners and friends.

"Their co-operation has contributed in no small measure to the remarkable progress which both countries have enjoyed since the time of Commodore Perry. It is Japan's earnest hope that participation in the New York World's Fair will serve to strengthen the ties of understanding and goodwill which have bound us together for so many years."

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A larg vein of molybdenum ore, important in steel making, has been found quite by accident in a test bore made at the Yangchiachangtze workings of the Manchuria Lead Mining Company in Chinchow Province, Manchuria, where the company had been prospecting for lead and zinc, according to the *Yomiuri*.

The vein is reported to be several yards wide and about 100 yards long, while its depth has not yet been determined. It contains

0.5 per cent molybdenum, the richest vein of the mineral so far found in Japan or Manchuria in any large quantity.

The Manchuria Lead Mining Company immediately set about changing its zinc ore smelting plant into one for turning out molybdenum. It is expected that about 200 tons of the refined metal can be placed on the market before the end of the year.

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Japan was determined to effect a thorough solution of the settlement and concession question in China, and prepared for the "worst eventuality" that might arise, Major-Gen. Teiichi Suzuki, Director of the Political Affairs Bureau of the Asia Development Board, declared at Tokyo on June 13, according to Domei.

Officials of the board have remained silent on developments at Tientsin and declaration by Major-Gen. Suzuki was his first on the subject.

"Concessions and settlements had their origin in the disorderly conditions in China," Major-Gen. Suzuki declared, "and therefore, now that there is being established a complete new order under the new régimes, I believe that they should be returned to China.

"On the contrary, the British authorities on the spot do not understand the nature of the matter, and since the outbreak of hostilities they have adopted an attitude which seems to aim at the disturbance of peace and order in the concessions and settlements by harboring malcontents and letting them persist in destructive movements which hamper the establishment of a new economic order.

"Obstruction of a new order not only is a hostile action toward a new China but an unpardonable action against Japan.

"And Japan, which is committed to the construction of a new East Asia, must eradicate obstructive actions against the creation of a new order in the concessions and settlements.

"Japan is absolutely determined to bring about a solution of the concession and settlement question in co-operation with the régimes of a new China, and in order to achieve this aim she is prepared for the worst.

"Of course, the new régimes in China do not intend to expel all the Britons and Frenchmen from the concessions and settlements. If the authorities of the concessions and settlements are willing to co-operate in the establishment of a new order then the question assumes a different character.

"At any rate we must thoroughly eliminate conditions which make the concessions and settlements centers for disturbance of peace and order and bases for economic machinations.

"For her own sake we regret the attitude of Britain, though we do not know what change it may undergo in the future."

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Questions relating to the China hostilities, the European situation and American rearmament were answered frankly by President Roosevelt during a private interview with Mr. Yoshitaro Kusuyama, foreign editor of the *Tokyo Nichi Nichi*, at the President's home in Hyde Park, New York.

In his cable to the *Nichi Nichi*, Mr. Kusuyama explained, however, that the President had requested that his views on international political matters be kept off the record.

The visiting foreign editor was free to quote Mr. Roosevelt's comments on matters of a non-political nature, however. He was quite interested in Mr. Kusuyama's work and asked many questions about the *Nichi Nichi* and its sister paper, the *Osaka Mainichi*. He also said he would like to visit Japan when he can find time.

"I have many friends in Japan," the President said. "I should like very much to visit my old Harvard classmates, Mr. Otohiko Matsukata and Mr. Ryozo Asano (president of the Asano Cement Company). Yes, I should like to visit your country, but I do not know when that wish can be realized."

The interview was arranged by Mr. Fred Storm, White House correspondent for the *United Press*.

When he arrived at the Hyde Park estate, on the Hudson, Mr. Kusuyama noted that it seemed to be quite heavily guarded. After he had passed the inspection of the Secret Service men, the *Nichi Nichi* editor was admitted to the "summer White House" where he was received by Mrs. Sara Delano Roosevelt, 76-year-old mother of the President.

"She is a gracious lady," Mr. Kusuyama said, "and is hale and hearty despite her advanced age.

A three-reel film titled Saito Returns, giving a complete pictorial account of the mission of the United States cruiser *Astoria*, which remained in port at Yokohama for ten days after bringing back on April 17 the ashes of Mr. Hiroshi Saito, former Ambassador to Washington, will be delivered by a goodwill emissary shortly to President Roosevelt, who sent the warship to Japan.

The movie, with sound and commentary, shows the arrival of the *Astoria* in Yokohama harbor, the transfer of Mr. Saito's ashes to the pier, the processions winding through the streets of Yokohama and Tokyo, the State funeral at the Nishi Hongan Temple, and the garden parties and sightseeing trips arranged for the officers and men of the warship during their stay. The sequence was filmed by the Nanwo Shoji Kaisha, under the direction of the *Astoria* Welcoming Committee, with the co-operation of the Foreign Office.

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The Shanghai Bankers Association has petitioned the Chinese government in Chungking for more five-cent and ten-cent nickel coins to be sent to Shanghai in order to settle the problem of the acute small money shortage here. The shortage has become so serious that in numerous cases Chinese shops pay change with postal stamps.

It is generally believed in Chinese circles that the shortage is due to the fact that many merchants have been buying coppers for the Japanese, who are alleged to have shipped them to their country from Hongkew in large quantities. It is admittedly hard to control the situation here, as the Chinese government cannot exercise influence over Shanghai. The order issued long ago by the Ministry of Finance forbidding people to smuggle out coppers under severe penalties has been ignored in Shanghai but it is strictly carried out in districts under Chungking's control.

The Central Bank of China sent many new coppers to Shanghai long ago to relieve the shortage then, but seeing that the coppers quickly disappeared from the market, no further efforts have been made to obtain coppers from the Government mint, it is stated by a Chinese evening report.

The shortage has seriously affected the middle and poor classes of people here, since they have been forced to pay more than unnecessary for large quantities of goods they actually need. When a man wants to buy 15 cents of melon seeds he is advised to buy 20 cents worth of them, because there is no change. By paying change in postage stamps many shops have so far settled the problems smoothly. Beggars in Shanghai have suffered because fewer people care to give them coppers.

Apart from the Chinese bankers' wish for more nickel coins it is also reported that the Chinese government may print copper notes for circulation in Shanghai in order to prevent copper smuggling.

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A *Japan Advertiser* report says that passing through Japan *en route* to the United States, Mr. Frank A. Brown, of the American Presbyterian Mission South, who has spent many years in China, visited the Foreign Office on May 30 to express his appreciation for the Japanese respect and protection which was extended to American lives and property in Hsuchow, Kiangsu Province.

He said that although the vicinity of the city, which had a population of about 150,000, was bombed severely by the Japanese for about eight consecutive months, the Japanese officers kept all promises which they had made regarding the safety of foreign lives and properly there.

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Through the mid-month weeks of June the authorities of the foreign communities of Shanghai staged a Safety First campaign in an effort to reduce the appalling number of street accidents caused by the Port's congested traffic. This was carried out by adorning vehicles in general with illustrated posters, pictures in the cinemas, warnings given in the newspapers, and in a variety of other ways. The general effect doubtless will be to make drivers, who ordinarily are prudent, more careful. That class of moron drivers, fairly constant in all lands, will proceed blithely on their homocidal way. At some distant future day Shanghai may catch up with the modern world and apply tried scientific methods to the question traffic accidents, as has been done in such centers as Paris, London, the Scandanavian cities and in the cities of Japan. By the simple expedient of silencing the nerve-wrecking motor blasting these cities uniformly have cut totals of traffic accidents by a third.

THINGS TO WORRY ABOUT

Why is the Russian so Coy?

Moscow, June 5.—Soviet Defense Commissar Marshal Klimenti Voroshilov, who was invited to witness the forthcoming British army manoeuvers in September, has declined to accept on the grounds that the Soviet army manoeuvers will take place at the same time, authoritative circles here learned to-day.—*Domei.*

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An Echo from Munich

London, June 8.—While affirming that the one desire of the British Government was to throw the whole weight of the Empire on the side of peace, Lord Halifax, the Foreign Secretary, emphasized that the "day has gone by when the independence of European nations can be destroyed by unilateral action" in the course of a foreign affairs debate in the House of Lords yesterday. Lord Halifax added that "it is clear that any attempt to do so will meet with wide and resolute resistance."—*Reuter.*

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Page Pappa Dionne

New York, June 12.—Paul B. Findley, married for 20 years and childless, will get $100,000 if he becomes a father.

The will of his mother, Mrs. Kate C. Findley, of Sewickley, Pennsylvania, who died last February, provides that Mr. Findley will receive her residuary estate if he has a child.

If not, he will receive only life income, and the principle will go to the American Bible Society at his death.—*United Press.*

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How to Start an Argument

London, June 19.—British firms are negotiating with Japanese agents in London for the purchase of 68,000 cases of Japanese canned salmon for £67,000, the *Sunday Dispatch* reported yesterday. The paper said the deal, which is expected to be closed within a few days, would enable Japan to dispose of her entire salmon surplus for this season.—*United Press.*

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He Could Send Them to Shanghai

Massillon, O., June 19.—A proud father walked into Dr. J. S. Williams' office, hoisted a heavy pail onto the doctor's desk, and said: "There's your money."

Dr. Williams was startled, so the father explained that the bucket had 3,500 pennies in it, all saved to pay for the boy Dr. Williams had delivered a few weeks before.—*United Press.*

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Why?

Washington, June 4.—Vice-President John N. Garner will be a candidate for the Democratic Presidential nomination in 1940 regardless of President Roosevelt's decision regarding a third term, authoritative sources disclosed last night.—*United Press.*

* * *

Just Too, Too Awful!

Berlin, June 9.—The official German D.N.B. news agency to-day severely criticized Mrs. Roosevelt, wife of the President of the United States, for her Democratic spirit, attempting to paint her as a rabid Communist in commenting on the Washington reception for Their Majesties King George and Queen Elizabeth.

"Mrs. Roosevelt, who had worthily prepared herself for the visit of the British Monarchs by speaking at a Washington Communist meeting, remained true to form by letting negroes sing at the White House concert in honor of the Royal Couple," the German agency said.

* * *

Why they call them "Hicks"

Washington, June 8.—While the parade in honor of the visiting British King and Queen was going on, the irrepressible Representative Martin L. Sweeney, Democrat of Ohio, who frequently ridiculed the visit of Their Majesties on the floor of Congress, sent a telegram to the King at the White House asking what was going to be done about the war debt.—*I. N. S.*

Another Blow at Hitler

Los Angeles, June 9.—Glamorous screen star, Marlene Dietrich abandoned her German nationality and became an American citizen to-day. The naturalization procedure was ratified before the local Federal Court in a brief official ceremony.—*Havas.*

* * *

Shanghai Scores Again

Shanghai, unique among cities of the planet in so many particulars, has achieved new distinction as being the only place ever known to debase its token currency. Thus the prettily-designed five cent coins, hitherto in use on omnibus transport lines, now is worth but four cents.

* * *

Warning to Pseudo-Parents

Chicago, Illinois, June 12.—The *American Medical Association Journal* warned editorially that persons who have "test tube" babies "put aside false pride and considerations of delicacy" and legally adopt such offspring.

Otherwise, the journal said, "there is the possibility that interested relatives may learn of the circumstances and may procure the evidence necessary to overcome the presumption of legitimacy and may thus deprive the child of a share of intestate property."

* * *

For Young Patriots with Low I.Q.

For the information of the college boys who have been gulping 80 or so goldfish, it was estimated the human stomach has a physiological limit of between 125 and 150 goldfish of gulping size. This was figured out by Prof. Sarah Atsatt, zoologist of the University of California at Los Angeles who makes no guarantee for the survival of any campus lad so rash as to try for the limit. Such a prodigious gulp, she said, would be about a pound of fish. This would contain about 1,000 calories.

* * *

"Hope Springs Eternal"

London, June 11.—The British Cabinet believes it possible to grant satisfaction to Germany by peaceful methods and is contemplating the convocation of an international conference from the agenda of which no question, not even the colonial problem, would be excluded, the *Sunday Express* stated this morning, this view being shared by the majority of the Sunday press.

* * *

An order from Stalin

Chungking, June 9.—The arrest and punishment of Mr. Wang Ching-wei, deposed Deputy Executive of the Kuomintang, was ordered by an official mandate issued last night by the Chinese National Government.

The mandate states:

"This order was issued upon the receipt of over 1,000 petitions from Chinese abroad and also those throughout the country, demanding the punishment of Mr. Wang Ching-wei, who, in cooperation with the enemy, is endangering the state."

* * *

Hitler Wins in the U.S.A.

New York, June 11.—The United States representative of the National Socialist Central Publishing Company Franz Eher Nachf, of Germany, obtained from the Federal Appellate Court yesterday an injunction against the New York publishing firm of Stackpole & Sons to restrain the publication by this firm of an unauthorized version of Adolf Hitler's book "Mein Kampf" or by a certain newspaper concern.

* * *

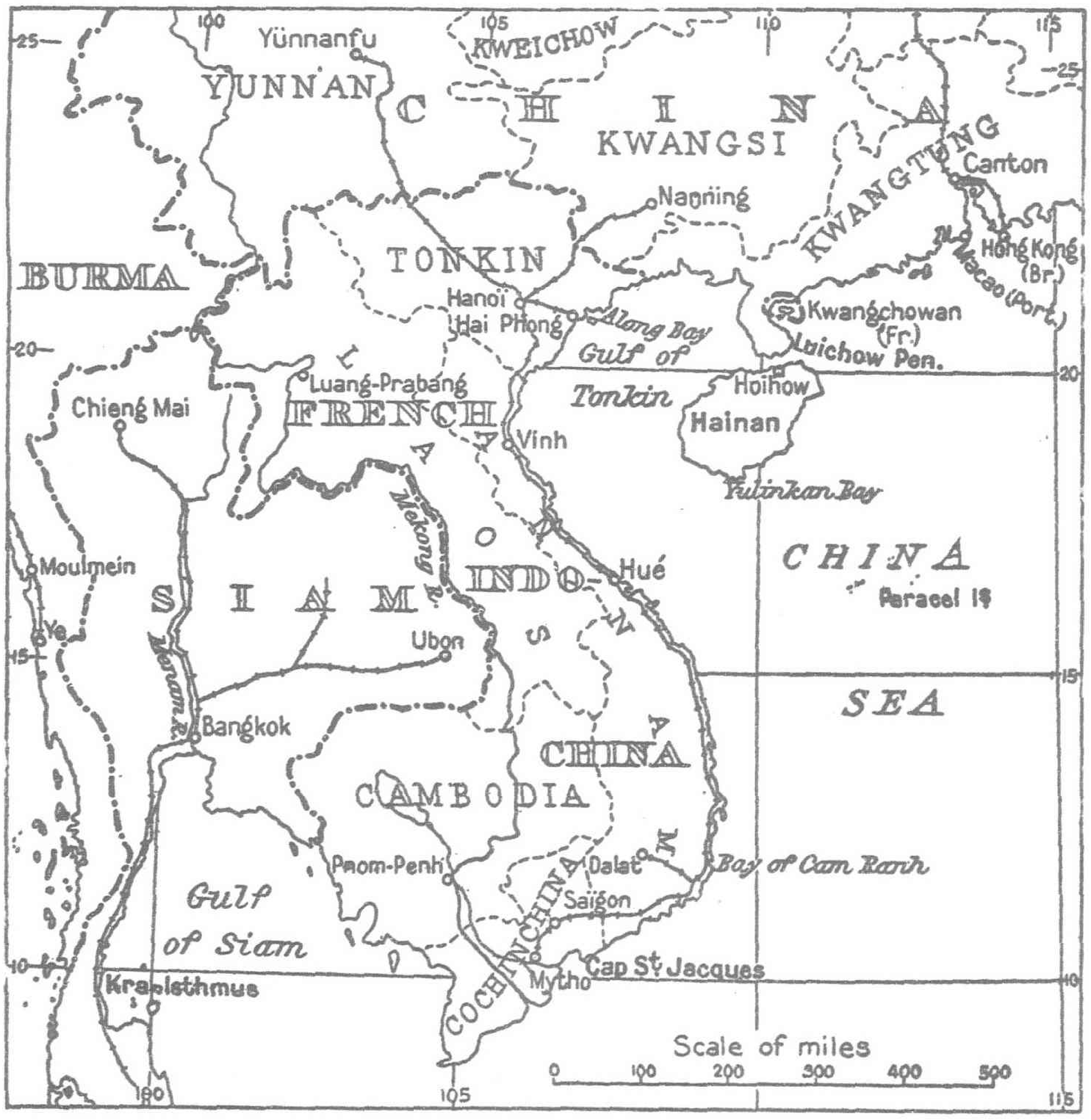
This Changes Everything

Chungking, June 2.—For the duration of the Sino-Japanese hostilities, the time recorded in Chungking will be considered as the Standard Time throughout China, according to a ruling made by the Ministry of Interior.—*Kuo Min News Agency.*

Indo-China in the Path of Japanese Expansion

By ALEXANDRE VARENNE in Foreign Affairs

THE irrepressible conflict between ideologies is not confined to Europe. The present Sino-Japanese war is as much a part of this world-wide struggle as is the Spanish civil war. Under the guise of a mystic "anti-Communism" the totalitarian Powers are pursuing a policy of ruthless expansion to which only the energetic and concerted action of all of the democratically-inclined nations can put a stop. But before these Powers can make any such determined stand against aggression, certain of them—particularly England and France—must give up the obsolete and dangerous idea that all the nations of Europe are bound together by close ties of family solidarity and that they must therefore stand unitedly against the rest of the world. None of the great nations is any longer exclusively European, Asiatic or American, Great Britain, France, the Netherlands, Russia, the United States—and even Portugal—are Far Eastern Powers by virtue of their territorial possessions in that part of the world. Each of these must, therefore, ponder the eventualities of the Sino-Japanese conflict, determine its own position towards the issues at stake and decide what it can contribute to the common task of pacification and reconstruction.



II

France has a number of specific interests in the Pacific: Indo-China (including the leased territory of Kwangchowan); large investments throughout China; and numerous island possessions in the South Pacific. Of these the most valuable is Indo-China, with its vast resources and its key strategic position—commercial, political and military. Its population of twenty-four million, larger than that of any other French colony, comprises many diverse peoples. Some of them—the Annamites, the Cambodians and the Laotians—are of ancient civilization; others represent more primitive races, attracted into the peninsula in relatively recent times by its ready accessibility from both the Asiatic mainland and the Malaysian Archipelagoes.

French penetration into Indo-China began with the occupation of Cochinchina seventy-five years ago. During the ensuing two decades French control was progressively extended to Tonkin, to Annam, then to Laos and Cambodia. In 1898, following the example of the British at Weihaiwei and the Germans at Kiao-chow, France obtained a ninety-nine-year lease on Kwangchowan. But this territory (325 square miles in area) is not located at the mouth of one of China's great rivers—until recently her only highways—and therefore has small commercial or strategic importance. Kwangchowan is not to be compared with Hongkong, or even Macao. If the French had pushed toward Yunnanfu or occupied a part of Hainan, they would have gained more. But at the time it was rather a question of "doing as the others do" than of pursuing a foresighted policy of expansion. Kwangchowan is to-day administratively attached to Indo-China.

French Indo-China is a colony and is administered by a governor-general. It is divided into five parts: Cochinchina, a protectorate, whose governor resides at Saigon; Tonkin, which is under the direct administration of France; and the three "protected" kingdoms of Annam, Cambodia and Laos, whose kings are assisted by French resident-generals. This ensemble of small states is to-day perfectly united under that régime of benevolent and well-organized firmness which characterizes French colonial policy.

We in France have for far too long entertained the idea that the personality of our colonies would in time inevitably fuse with our own; that their aspirations, their needs, and the conduct of their foreign affairs could not be separated from ours; that the risks which they had to face could not be other than those we ourselves confronted; in short, that their destiny depended exclusively upon our own. We have, for instance tended, to forget that Indo-China is an integral part of the Far East, separated from the metropolis by ten thousand miles, and that its fate will be determined in very large measure by those moral and material forces which it can generate within itself. Concretely, this means that if Indo-China were to be attacked during a general conflict, it could rely only upon such means of defense as were at its own immediate disposal. France's plain duty is, therefore, to put Indo-China in a state to resist any such attack.

France is anxious to preserve friendly relations with all her neighbors; yet at the same time she is firmly determined not to allow the slightest violation of her territories, or the slightest attack upon her acquired rights. In the Pacific she has, as a result of Indo-China's privileged position at the junction of the Oceanic and Asiatic worlds, special international obligations. For her to protect this privileged position and to discharge these obligations, she must see that Indo-China's economy is on a sound basis. Otherwise there is little hope that her Far Eastern empire can be made ready to defend itself.

Until recently, Indo-China was almost exclusively an agricultural country: its wealth was largely derived from the export of rice to Malaysia, China and Japan via Hongkong and Canton. However, the simultaneous stabilization of the Indo-Chinese piastre and the collapse of the silver standard in China, added to the world-wide depression, caused such a rise of prices in Indo-China that foreign markets became closed to its products. It has been extremely difficult to counteract this tendency on account of the expansion of rice culture in such countries as Siam, the Philippines and the Netherlands East Indies. The consumption of rice in France has meanwhile increased, but this has been merely a palliative. Indo-Chinese economy has had to discover new resources in the cultivation of secondary crops: maize, tea, coffee, and industrial products such as rubber. The first three are largely consumed on the spot. Rubber, on the other hand, must be exported in order to be processed. However, under present circumstances Indo-China's raw rubber cannot be sent to France, manufactured and then sold in the oriental market at a profit.

The question has therefore naturally arisen whether industries should not be set up in Indo-China in order that its resources can be turned into manufactured products on the spot, for both local and foreign consumption. Since there is serious over-population in certain regions of Indo-China, notably in the Tonkin delta, the idea of industrializing the country has the advantage of offering a promising remedy for more than one urgent problem. The country is rich in coal and certain other raw materials. Labor is plentiful. And southern China offers a nearby market for Indo-China's manufactures. This is particularly true as regards Yunnan and Kwangsi, which are in direct and easy contact with Tonkin, and which possess mineral deposits complementary to those of the French colony. It is precisely these provinces, far removed from the influence of the central government and long opposed to it, that have in recent years effected an astonishingly successful program of recovery and reorganization. Here, under the direction of the two principal leaders of Kwangsi—Marshal Li, now in command of the Shantung armies, and General Pei, Chief of Staff of the Chinese Army—tens of thousands of men are at work building highways and railroads, modernizing cities and creating new cultural centers. Some of the latter, the one at Yunnanfu for example, have reached such a stage that several universities have been transferred there from northern Chinese cities now in Japanese hands. Furthermore, it is across these two southernmost Chinese provinces that access is had to Szechuen and Kweichow, where progress is going on at an equally rapid rate. For many years to come, the inhabitants of these four provinces, numbering more than one hundred million, will be dependent upon foreign sources for everything that modern industry produces. They are counting on France's more advanced technical civilization to help them modernize their own material culture. It would be folly for us to turn a deaf ear to their appeal.

Obviously this collaboration cannot be fruitful without serious effort on our part. Though some of the roads in Indo-China are excellent, those along the northern border were laid out primarily with strategic objectives in view. They are a reminder of the time, which now seems so far away, when Indo-China was felt to be threatened by a fierce and anarchic China, against which we then dogmatically opposed refined and civilized Japan, the avenger of human wrongs. We must therefore expand our highway system in order to tap the commerce of Yunnan, Kwangsi and the coastal zone of Kwangtung. Such a road network would supplement the existing railroads from Hanoi to Yunnanfu and to Nanning, which can be extended only with great difficulty and expense.

We must also improve our ports. The harbors of Hai Phong and Saigon might have been adequate fifty years ago, but they do not respond to the needs of to-day. The entrance to the port of Hai Phong can be navigated by large ships only at high tide, and the channel, which is constantly silting up, must be dredged at an expense quite disproportionate to the results obtained. Saigon, a river port and the center of rice export, is well equipped but lies inland forty miles from Cap St. Jacques. Its strategic value is thus diminished by the fact that it could be bottled up with relative ease.

The harbor of Cam Ranh, on the other hand, offers a marvelous site for a first-class naval base, as has been universally recognized ever since Admiral Rodjestvensky's fleet of 145 ships sought shelter there on its famous cruise from the Baltic to Far Eastern waters during the Russo-Japanese War. This splendid harbor, completely sheltered from typhoons, lies between two high promontories with a vanguard of islands completing its natural defense. Its ever-calm waters offer hydroplanes and submarines as excellent a refuge as they could wish. Situated at the easternmost point of the Indo-Chinese coast, it is on a direct line from Singapore to the Formosa Strait and less than a thousand miles from Manila. The Trans-Indo-China Railroad runs along the bay and thus provides communications with Saigon to the south, Hué and Hanoi to the north, and—towards the interior—with Dalat, the climatic capital, and the higher regions of Annam. The French Government has decided to fortify Cam Ranh and make it its principal naval base in the Orient. Work on this project has already been started as part of the large defense program which the French Government is undertaking with a 400,000,000-franc loan recently raised, partly in Indo-China, for that purpose.

Farther north lies the Bay of Along, located in an industrial and coal-mining region near the center of various routes radiating from Tonkin into southern China. It thus has great commercial possibilities. A proposal to establish a free port at Along is being considered; if carried out, such a plan would greatly facilitate the movement of trade across Indo-China to southern China.

III

These, of course, are merely the preliminary steps in a program of development which would be of wide and general benefit. But before any such program can be undertaken peace must be re-established in the Orient. It is futile to make plans for the development of Indo-China until its security has been assured. And this security is something which can be assured only by France.

What are the threats which Indo-China must be prepared to parry? In the past, the principal danger to its safety was the instability of China. To-day, the great peril is Japanese expansion. Nor is this danger limited to Indo-China: the immoderate ambitions of those who rule Japan extend to the Philippines, Malaysia and India. Japan's recent attempt to gain a dominating influence over Siam is evidence of these aspirations.

Siam's geographical position, surrounded by French and British territory, could not fail to attract the attention of Japanese imperialists of the Tanaka school. The strategy of the Japanese General Staff doubtless envisages penetrating Laos and Tonkin from Siam as a means of invading the southern provinces of China. Roads and railways, some already built and others being actively pushed to completion, radiate from Bangkok towards Indo-China like the extended fingers of a hand. They were originally conceived with purely economic objects in mind. But it was inevitable that the expansionists should seek to exploit their strategic possibilities.

South of Siam lie the Straits Settlements, with the formidable British fortifications at Singapore. These now command the passage between India and the Pacific; but their strategic domination of the great sea route between Europe and the Far East could be nullified by a canal through Siamese territory, across the Isthmus of Kra. This project is without any commercial value and would be difficult of realization from an engineering point of view. Yet, under German and Japanese inspiration the Siamese Government was for a time apparently giving it favorable consideration. Only after the energetic intervention of the British Government was the project dropped, for how long no one knows.

The last ten years have been a difficult period for Siam. After weathering a series of revolutionary movements King Pradjadhipok finally abdicated in 1935 and a mere child was placed on the throne. Since then two personalities have dominated Siamese politics: Luang Pradist, an extremist of the first water, twice banished to exile; and Luang Bipul, soldier and nationalist, and of the two more open to outside influences. These men wind and unwind the threads of intrigue, delaying the country's return to the stability necessary for its normal development. Berlin and Tokyo have naturally sought to turn this situation to their advantage. But their efforts, at first quite successful, seem to have led to little in the end. Anti-British and anti-French sentiment among Siamese political leaders is on the wane. Perhaps they feel that they have been the dupes of Japanese policy; if so, they show more shrewdness than have the Japanese leaders similarly duped by Hitler.

Nevertheless, certain agreements seem to have been entered into between Siam and Japan, though we can only surmise their exact nature. Anti-French propaganda in Siam has never been so intense as at present—it even flows over into Laos, where venomous pamphlets, strongly smelling of Japanese origin, are being distributed. Agents who seek to persuade soldiers to desert from the French forces are allowed to operate from Siam. In recent treaties Siam has suppressed all references to the League of Nations: in doing this, she has been following the style set by the totalitarian governments.

France would like to renew cordial relations with Siam. But this desire must not retard the creation of a defensive system along the frontier between Siam and Indo-China. Indeed, mutual confidence will again characterize those relations only when the Siamese Government—and behind it, Japan—discover that Cambodia and

Laos are prepared successfully to resist any attack made on them from the west.

We must not, however, exaggerate this danger from Siam. It is rather on its maritime frontiers that Indo-China may expect an attack. If our precautions in this direction had been more imposing, the demand recently made upon the Governor-General of Indo-China by the Japanese Consul at Hanoi—that the French authorities should prohibit the transport of war material to China over the Yunnan Railroad—might have been presented in a less peremptory form. Though this railroad is the property of a French company, that part of it lying in Chinese territory was threatened with destruction by Japanese aerial bombardment. We need not discuss here the impropriety of this demand, which in any case resulted only in our taking the necessary precautions. After all, is it not true that in the present war—a war without belligerents and therefore without neutrals—third Powers are completely free to trade with both sides ? And is not Japan—whose ships load cargoes of coal, ore, salt, sand and cement in Indo-Chinese harbors —profiting greatly from this freedom ?

Other occurrences have also aroused our suspicions. Japanese warships have cruised along the Indo-Chinese coasts and Japanese airplanes have flown over Hai Phong. An attempt was even made to occupy the Paracel Islands, which France regards as part of the Kingdom of Annam. These low, tiny islands—without inhabitants or resources, continually worn by the sea, and inaccessible during the north-east monsoon—have no real strategic or commercial value. For a number of years France has claimed them, though this claim has been contested by China. Early last July the French Government sent a small armed force to the islands as a warning that it would not tolerate any Japanese attempt at occupation.

A more important object of Japanese attention is the island of Hainan, whose coasts have recently been bombarded on several occasions. Hainan's position at the entrance of the Gulf of Tonkin is of great strategic value. The port at Hoihow, on the northern shore of the island opposite the Luichow Peninsula, is difficult of approach and cannot be used by ships of heavy tonnage. But at the island's southern tip is the harbor of Yulinkan, which could be made into a naval base of the first order. Furthermore, Hainan's mineral resources would be very useful in the development of war industries. The Chinese authorities, thoroughly aware of the island's value, have taken steps to improve its defenses. In view of Hainan's proximity to Indo-China, France, who considers the maintenance of free navigation in the Gulf of Tonkin of vital importance, would regard a Japanese occupation of the island as an attack against French interests. These circumstances explain the categorical warnings which the French Government, with the active support of Great Britain, gave Tokyo in the latter part of June when it was feared that a Japanese landing on Hainan was imminent.

IV

As these lines are written there is no way of knowing what will be the outcome of the present conflict in the Far East. Let us, however, suppose for the moment that the struggle can be kept from widening into a general world war. A localized war could have but one of two possible outcomes : either Japan wins or she loses. Let us consider for a moment the first hypothesis. A Japanese victory could be expected to lead to the following developments : North China would become a second Manchoukuo ; Shanghai (and probably other ports), the coastal zones and the lower reaches of the great rivers would remain under Japan's authority ; Japanese commercial and industrial control would be imposed on all other areas in China where there were important mineral resources ; China's armies would be disbanded and her war material would be either confiscated or destroyed.

Yet despite her dismemberment, China would issue from the conflict still vigorous and ripened by experience. No matter how Draconian the conditions imposed upon her by the victor, she would still greatly exceed Japan in population, in territory, and therefore in total potential power. This new China, whether its government were located at Hankow, Chungking, Changsha or elsewhere, would derive its chief strength from the regions south of the Yangtze. There, in such active and modern provinces as Szechuen, Kwangtung and Kwangsi, the Chinese people would carry on the patient work of reconstruction and restoration at which they have always excelled. It is there that the spirit of revenge would ripen. Cut off from Shanghai, and most likely from Canton, this new Southern China would naturally turn towards Indo-China. Such a reorientation in China's communications and interests would inevitably stimulate the economic development of Indo-China.

As for Japan herself, she would be completely ruined by her military triumph. Her people, exalted by victory and blinded with racial pride, would lose all sense of proportion. More than ever would they unquestionably follow those among their leaders who regard the overthrow of China as merely one stage on the road towards the conquest of all of Asia. Consequently, after the necessary recuperative pause the war would begin again. This time it might well be Indo-China that would have to bear the brunt of the first assault, for two reasons : first, this would permit an attack on China in the rear ; and second, the conquest of Indo-China would open the way to India, located at the center of the third circle in the famous " Tanaka plan."

So much for the first hypothesis. Let us now suppose that instead of winning the war, Japan loses it. Such a *dénouement* would, it seems certain, bring results not far different from those produced by victory. Japan's crowded and wretched population, disappointed in its hopes, humiliated in its pride, would be driven to seek salvation in new adventures. The desire for vengeance against China would dominate every other emotion. Having once set out to conquer China, Japan would not rest until that end had been accomplished. Another Japanese attack would therefore be only a question of time. When it came, the security of Indo-China would almost inevitably be in jeopardy. Supposing—in accordance with our second hypothesis—that the Japanese army had failed in the present war to subdue China on her northern and eastern plains, in that event would not the naval authorities be only too delighted to say : " Ah, if you had only taken our advice ! " This would certainly satisfy their ancient grudge against the General Staff which has always opposed the navy's demand that China be attacked from the south. In another Sino-Japanese war the navy's advice might very well be taken ; and if it were, Indo-China would be in danger, whether or not Japan were in the end successful in completing the subjugation of China.

We cannot conclude this survey of French interests in the Orient without considering the possibility of a general war in which the democracies would presumably be lined up against the totalitarian states. A union of forces between Germany, Italy and Japan would make the situation of France's empire in the Far East more precarious than ever. Japan might under these circumstances regard Indo-China as easy prey, to be snapped up at once and used as barter when the peace treaties were drawn up after the war. After occupying Indo-China, she might, for instance, turn it over to Germany, who would certainly not disdain so royal a gift in exchange for confirming Japanese sovereignty over the former German islands in the Pacific.

From the considerations that have been advanced above it is clear that France is thoroughly justified in organizing a strong defensive system in Indo-China. Indeed, much more than mere French interests are at stake. Indo-China is a link in a chain of defenses that extends from Singapore to Vladivostok. Our British friends are making methodical and powerful efforts to arm the Straits Settlements and Hongkong ; vigorous steps are also being taken in the Philippines and in the Netherlands East Indies. France must co-operate effectively in this task, not only to guarantee the integrity of her own colonial domain, but to assist in the work of common defense against the disturbers of world peace.

Japan's Big Pacific Liners

Japan will move to the forefront in trans-Pacific shipping when two 28,000-ton liners, now under construction at Nagasaki, will be completed, Nippon Yusen Kaisha officials revealed.

The vessels, which will be named *Kasiwara Maru* and *Izumo Maru*, are expected to be launched early next year. In size they will exceed the *Empress of Japan*, 26,032-ton Canadian Pacific liner, which is now the largest steamer in operation on the Pacific.

Meantime, the *Nitta Maru*, one of three new Orient-Europe liners built by the N.Y.K. slid down the ways at the Mitsubishi dockyard in Nagasaki on May 20.

Price Control in Japan

Of the four generally recognized methods of checking the course of inflation in Japan—Exchange Control, Import Control, Export Control and Domestic Price Control—the first three mentioned steps have been enforced with a fair degree of effectiveness, having met with some measure of success. There is every indication, however, that the three checks first mentioned are in themselves insufficient and that the scope of their application will be extended and the method of their operation will be intensified. Additionally, the question of Domestic Price Control is now receiving the careful attention of the Japanese Government.

Mr. Seihin Ikeda, the Chairman of the Central Price Policy Commission, has announced that the people must realize the gravity of the price problem and bear considerable privations and inconvenience, as no matter how great the cost of keeping prices down may be, it will be small compared with the cost of unlimited inflation.

Hitherto, the activities of the Central Price Policy Commission have been devoted largely to certain industries, picked at random, for which prices have advanced at an excessive rate and for which Official Maximum Prices have been established and generally enforced. The products for which Official Prices have already been enforced include major items, such as textiles, rubber, steel, cement, etc., and run all the way down the scale to paper umbrellas and other inconsequential items.

These control measures have usually been effective in curbing the rise of prices caused by speculative transactions, but the fundamental cause of high prices is the lop-sided situation in the demand and supply of materials. Thus all price policies hereafter must center in adjustment of supply to demand. The time has come, therefore, for the Government to establish and enforce co-ordinating measures basically covering all financial and economic fields, to adjust the production, distribution and consumption of raw materials, labor power, transportation, rents, wage rates, savings, etc., etc. The local press has announced particulars of a Price Control Plan which has been handed to the Government, which has already committed itself to apply it. In brief, the plan may be described as follows:

1.—Aims of Price Control

The aims of price control include a desire to maintain the present exchange rate, to promote exports, to still social unrest and to increase the production of certain products. Higher commodity prices would hamper export trade, reduce capacity to import necessary raw materials, affect the thrift of the people and make impossible their further purchases of domestic bonds, and would undoubtedly tend to cause serious social unrest. One stated objective is to reduce prices not only to the level existing before the China Incident but also in general to the international level in order to promote exports.

2.—System of Fixing Prices

An attempt will be made to maintain just relations between official prices and production costs. Means, however, are to be found to make not only the cost of materials, but wages, transportation costs and rates of profit as well conform to a Price Policy. In order to regulate living costs, adjustments in land and house rents are to be made.

It has been announced that official prices will be computed in "accordance with standards and formulæ generally considered valid in wartime." The essential points to be considered are:

(*a*) Scope of articles for which official prices are to be set and for which production standards are to be established, include all materials needed for the expansion of productivity, all materials required for export articles, all products within the field of munitions and all goods coming under the heading of "daily necessities." Other articles are, for the time being, to be outside the scope of official quotations.

(*b*) Order of Determination—Staple articles which are of the greatest importance in forming prices as a whole are to have their prices officially set first of all.

(*c*) Goods on which Official Prices are fixed are to have unified production standards and plans established for adjusting supply and demand so that official prices may be maintained. These goods, for which official prices are set, will be accorded priority in the supply of raw materials.

(*d*) There will be an attempt at harmonization between articles for which official prices are to be fixed with articles for which official prices are not set, by:

(1) Limitation or prohibition of use of raw materials in the production of articles on which there are no official prices, and
(2) Excessive profits being adjusted by means of special taxation.

(*e*) In the determining of "suitable wartime prices," calculations will be based principally on prime costs with reference to fixed price standards, and it is said that the methods of computation and procedure in application are about to be defined. These methods will cover raw materials, wages, transportation costs and profits. In computing prime costs the "principle of the mean cost of production will generally be adhered to." Official prices, however, are subject to revision should changes in prime costs exceed a certain unspecified margin. The Official Prices are to be maximum prices and sales of large quantities are to be made at lower prices.

Adjustment of Supply and Demand

It is the intention of the Commission to increase supplies of certain commodities and to maintain said supplies by decreasing the demand for them or, more specifically, by removing the possibility of satisfying demands for certain commodities. Increases in production and supplies are to be accomplished by:

(1) Enforcement of the materials mobilization plan
(2) Regulation of supply by assuring uninterrupted supply of goods
(3) Increase in productivity
(4) Increased importing activity
(5) Utilization of waste materials
(6) Utilization of unneeded goods held in storage by private or juridical persons, etc.

Demands, on the other hand, are to be reduced by:

(1) Both temporal and geographical regulation of demand on the part of the Government, Municipal Authorities, Military expenditures, etc.
(2) Regulation of the people's demands in general by:
    (*a*) Regulation of the general purchasing power, and
    (*b*) As individual consumption regulations are cumbersome, this is to be avoided to as great a degree as possible by a thorough absorption of the public purchasing power. This is to be accomplished by increases in savings and maximum thrift, revision of taxation, insurance and other systems of appropriating the funds of individuals, and finally by withholding increases in wages and salaries.

Distribution is to be controlled by an increase in the present control over manufacturers, wholesalers and retail agencies. Goods in storage are to be mobilized and utilized. There is to be control over goods and the hoarding of goods. Speculation is to be checked and banks will not be permitted to make speculative loans.

More Details Regarding Determination of Prices

Wages—Total wages are to be scaled down appropriately but not by cutting down individual wages and, at the same time, "elevation of employe proficiency is to be sought." Wartime wage standards are to be set for industries separately, demand

(Continued on page 234)

The Truth About Resistance

By *WANG CHING-WEI*

I RECENTLY received a letter from an Overseas Comrade stating that while he had the fullest confidence in my ultimate policy of peace and in the sincerity of my action in publishing my peace proposals, he had some doubt as to the appropriateness of the procedure I have taken. Since other fellow citizens may have the same attitude, I am taking this opportunity to clarify my position.

Should the extinction of China be the sole and only objective of Japan, then we have no alternative but to continue to fight. But Japan has put forward terms of peace which, properly interpreted, cannot be regarded as destroying China as an independent nation. Why can't we talk peace ? My friend Mr. Tan Ka-kee's conclusion that " he who talks peace, is a ' traitor,' " is based on false premises. Why should he who talks peace be called a " traitor ? " According to this line of reasoning, the Constitution which empowers the Government to conduct peace negotiations with a foreign nation, thus empowers the Government to conduct acts of treason ! The motto selected by Dr. Sun to guide us and prominently exhibited at the Central Party, namely, " Loyalty, Filial Piety, Benevolence, Love, Sincerity and *Peace*," would thus read Loyalty, Filial Piety, Benevolence, Love, Sincerity, and ' *Treason* ' ! "

Let us not bother about these things now, but return to our subject. It is maintained that " a war would soon break out in Europe, so why should we want peace at this time ? " The actual position prevailing in Europe now is undecisive ; while preparing for war, great efforts are made to maintain peace. Even the Governments in those countries themselves do not know whether and when war will break out, so how could one make such positive assertion ? Moreover, if war were to break out in Europe at all, Great Britain, France and Russia would be only concerning themselves with their own war problems, and as to America, she would naturally pay more attention to Europe than to the Far East ; so why gamble on such an eventuality ? In modern warfare, the aim of the warring parties is always to bring the war to the speediest possible conclusion, but once the war has started it is usually prolonged beyond expectation. Should the European war be prolonged, would it be advisable for us to follow suit and also prolong the war ? Even if the European war were brought to a quick decision, how could one foretell who is going to be the victor ? Granted one was right as to the victorious party, how could one know, in view of the complicated international relations and the conflict of interests, that the victory of that party will improve our situation ? Some are wont to say that in the next European war Great Britain, France and Russia will certainly fight on one side, and Germany and Italy on the other ; that America will join in on the side of Great Britain, France and Russia, with the result that Germany and Italy will be defeated, that Great Britain, France and Russia and America will turn their victorious armies and navies to fight Japan, and that Japan will either kowtow to their terms or be vanquished. This is optimism based on pure illusion. Can this be taken as the basis on which to formulate our war policy ?

It has been asserted that " our war of resistance is getting more successful every day," but I wonder if one could substantiate this statement by facts. Ever since the outbreak of the war our citizens have contributed to the war-chest, rendered services to the nation, and faced great hardships in fleeing from one place to the another, and yet not a single voice has been raised in resentment against the Government. Not less have been the sacrifices of the rank and file of forces ; they just march on, one after another, never showing any signs of faltering. Therein lies the Chinese soul of independence. On account of this alone Japan has come to the realization that China can never be destroyed. If peace can be successfully concluded it will be solely due to our determined civilians and courageous men under the colors. It would be wise, however, not to over-estimate nor under-estimate the strength of our resistance and the possibility of success. Should we over-estimate, our efforts would have been spent in vain, since we would be blind to, and fail to grasp, any possible success until the opportunity has passed.

In actual fact, the conduct of the war of resistance is getting more difficult every day. For is it not clear that since the outbreak of hostilities the loss of territory is unprecedented in history, in its immensity and shortness of time ? And even at the time of the Sun and Ming Dynasties, whenever a town or place is lost to the enemy, the Emperor will publicly proclaim his guilt and accept responsibility for the loss while the commanding officers will be duly punished. Now, however, the Government does not seem to care at all about the matter. A member of the Control Yuan once complained that " not a word of regret was ever heard over the loss of territory, while the annihilation of whole armies by the enemy was declared to be pre-arranged tactics." Thus was everybody silent. To find an excuse for the loss of many important cities and districts, it has been variously said that " there has been a change to a new position," " a change of tactics," " the strategic importance of the place has been lost," " the enemy having been inflicted heavy losses and the strategical advantages having been gained, it is no use to defend the place any longer," and such like. These phrases are uttered with the greatest of ease ; nothing can disturb the conscience as long as the public is made to believe that " our war of resistance is getting more successful every day."

In the declining days of the Sun and Ming Dynasties they still knew the meaning of " fighting " and " defending." Should they suffer a reverse it would not be their fault, for they had done their duty. At the present time, however, two new terms have taken the place of the old—one is " to give up " and the other, " to burn down." " Change of position " is the new expression for " giving up " for " burning down " there are many more. The fall of Canton is the classic example of " giving up " (and running away), and Changsha of " burning down." This happens nearly everywhere, and the war of resistance has often become " to give up " as quickly as possible and " to burn down " as thoroughly as possible. In consequence, an unprecedentedly large tract of land has been lost to the enemy within an unbelievably short space of time, while the guerilla tactics adopted by the communists have turned whatever has not been burned down into a No-Man's Land. Those learned in history understand that Communist guerilla warfare is just a euphemism for large-scale robbery. The people may be likened to the crops and the guerillas to the locusts ; where the locusts appear, there is nothing left. In former times, the people shivered with fear, when they heard of the robbers, but the Communist bandits of to-day are called guerillas and profess to have the secret of successful resistance to foreign aggression. Nevertheless, we must realize that a euphemism is a euphemism, unrelated to facts. People in foreign lands can only see the beauty of the written word, giving the impression that if only China resists the Japanese aggression to the very end, everything will be brighter as time goes on. But do overseas citizens have any idea as to the extent the people in the interior are suffering ? It is pathetic to see that the people's militia, which are of the greatest assistance to the regular armies, have been contaminated by the communists ! And, their sufferings are unspeakable. This is what one never reads or hears about. In a word, it cannot be denied—it is impossible to deny—that the war of resistance is becoming more difficult every day. Realizing this, should we be forced to go on resisting in the absence of another way out, we must point out the weaknesses of our resistance. For instance, the deception of the people practised by the authorities, and the robbery committed by the communists must be exposed ; otherwise, it would be like one suffering from cancer and refusing to submit to an operation while still curable. Resistance to the bitter end will simply become resistance without any purpose and without any result. If there is the way of peace other than the way of war, then we should summon the same determination and courage with which we have been fighting to open negotiations for an honorable peace—a peace with honor now rather than be forced to accept a humiliating surrender which will make all our sacrifices come to naught because we failed to seize the opportunity to negotiate on equal terms.

In time of war, people do not like to hear proposals for " peace," but only prophecies of ultimate victory. To-day, the people in

China, much enraged by the Japanese aggression, will not feel satisfied until they have conquered Japan; so when they hear of talks of peace, they become highly indignant. This is not unnatural with the average man-in-the-street. But with the Government it should be different; they should not be guided by sentiment based on misconceptions. It is right and proper for the Government to foster the spirit of patriotism, but it should guard itself against false pride; it is the duty of the Government to face the hard facts of reality—if war is inevitable, go to war; but if peace is possible, discuss peace. It is right that the Government should endeavor, at all times, to carve out a path of national existence. To-day, however, the Government are circulating more mis-statements of fact based on pure imagination than the people themselves can hope to invent. If the Government are just playing with words without any sense of responsibility, why should the people risk their lives in trying to find out the truth. The people seem to think that if China is conquered, the fate of all Chinese will be the same, but if anyone talks of peace, he alone bears the infamy of being labeled a "traitor." Why should he therefore open his mouth and take the responsibility of talking peace and telling the truth, the whole truth and nothing but the truth.

When I was in Chungking, I rented a small house, and was provided with adequate guards; I did not need to worry in the least about my personal safety. When the Japanese planes came to raid the city, I went down to the bomb-proof dug-out in the cellar. If Chungking, like Nanking or Hankow, were going to move, I would follow suit. Being the Deputy-Tsungtsai of the Kuomintang and the Vice-President of the National Defence Council, I had no actual power. If my advice is taken, well and good; if my word is disregarded, I cannot be charged with a crime. If resistance should collapse, I might hope to come out to take charge of the unfortunate state of affairs which, should I not be in a position to manage properly, still would leave me with the opportunity to die for the country, Thus, alive, I lead a life of ease; dead, I will be honored in history. In such a well-placed situation, why should I leave Chungking? Everyone knows that ever since I became an active revolutionary some thirty years ago, I have never thought of my own self and of my personal welfare. Why should I start thinking of my own selfish interests when I am over fifty years of age, seeing that the country, which I love so much, is on the verge of extinction? My mind has always been occupied with the idea how China when forced to take up arms, will be able to carry out a long-period resistance, how she will emerge a victor, and at the same time, how she can re-establish peace. My ideas with regard to peace have been said many a time at various meetings. Since the fall of Canton, and the burning of Changsha, I have become more and more convinced about the necessity for peace, for the sooner peace is re-established the better it will be for all concerned. Since after the heated debate with General Chiang Kai-shek on the question of Peace or War on the 9th of December, 1938, I realized that my plea for peace would never be accepted, I left Chungking on the 18th, and on the 29th I sent out my peace proposals urging Chungking to reconsider the question. Do people think that I was ignorant of the consequences to my person? If resistance is to go on, then my peace proposals will be rejected; and even if peace is finally concluded, my *bona fides* will still be questioned. Since my telegram of December 29, 1938, I have been keeping silent. My silence has been intended to give Chungking time to reconsider the whole question in the light of recent events and I told a Chungking representative that what I wanted was the acceptance by Chungking of my peace proposal, and nothing else, and that I was fully prepared to place my services at the disposal of the Government to achieve this end.

With regard to these peace proposals, I have every confidence that it will be realized. Objectively, China and Japan have to come to terms; subjectively, the Governments of the two countries want peace. Consequently, I don't worry so much about the ultimate realization of my peace proposals as about the thoroughness of their acceptance; because the enmity of the two peoples have, since the outbreak of hostilities, been deepened day by day, and it takes time to forget the past and start anew in a spirit of co-operation and mutual benefit. After two years of bitter fighting, the Chinese should have a clear conception as to the strength of the Japanese war-machine, while the Japanese should understand that China cannot be beaten to her knees. With a view to saving the needless sacrifice of lives and purposeless destruction of property, the Governments of the two countries should make it their duty to see farther ahead and take stock of their respective positions. I am of the opinion that the Declaration made by Prince Konoye on December 22, 1938, and my circular telegram of December 29, 1938, seem to see eye to eye in these respects. It is a great pity that Chungking did not take Prince Konoye's Declaration or my proposals seriously; Chungking has not even given me credit for my *bona fides*, it has had nothing but harsh words, untempered with reason. Recently, though signs of peace are not lacking, the approach has been one of avoiding the method of direct negotiation, of resuming the old method of the September 18th Incident, a method which subordinates the interests of nations to the interests of saving "face." This being so, how can we look to them for the salvation of the two greatest nations of the Far East? What worries me most has been this, and this only. Nevertheless, I cherish the hope that one day both Japan and China will realize the folly of their present actions and work hand-in-hand for the maintenance of permanent peace in the Pacific.

Prospects for International Borrowing

By KENZO OHSHIMA, in Contemporary Japan

THE decline in foreign investments amounting almost to a suspension, that has come about since the World War and especially since the financial depression of 1929, is of special interest to Japan at this time when the country is in dire need of foreign capital with which to develop Manchoukuo and North China. The decline involves many factors, but the two outstanding ones are the increased risk of losing the capital and a decrease of the funds available for investment.

Perhaps the greatest fear of a creditor country is that of a political overthrow in the debtor nation accompanied by a repudiation of debts. Instances have not been lacking since the Soviet disavowed all Czarist foreign obligations after the Revolution in 1917, and the prevailing international situation is so uncertain that the prospect of losing foreign loans seems ever imminent. As recently as March, 1938, Germany declared after the anschluss, that it would not pay all of Austria's debts, although this caused such a strong reaction in Great Britain, France and other creditor nations that Germany afterward assumed the liabilities. When President Vargas of Brazil established his Fascist dictatorship in November, 1937, he notified the Powers that he intended to suspend payments on both the principal and interest of all foreign debts indefinitely. After nearly three years of civil war, Spain has been pacified by General Franco whose nationalist régime has just been recognized by the Powers; Czechoslovakia meantime has ceased to exist. Naturally international lending cannot flourish amid such unstable conditions.

In addition to political change the investor must brave the hazards of departure from the gold standard and devaluation of currencies, which also have been frequent since 1929. The outstanding instance is the British abandonment of the gold standard on September 21, 1931, and enforcement of exchange control. Assured that the step would not be taken, it is said that the Bank of the Netherlands left £12,000,000 on deposit in London and suffered a loss of 30,000,000 florins, which exceeded both its paid-up capital of 20,000,000 florins and its reserves of 23,000,000 florins. Similarly caught, the Bank of France suffered the colossal loss of 2,000,000,000 francs. With Britain leading the way, it is not surprising that many other countries including several in Latin America, adopted the same policy in order to get rid of their economic difficulties. Another heavy blow to international credit was the United States' invalidation of the Gold Clause—an action blatantly revealing that country's lack of faith. When the dollar's value in gold was considerably depreciated at the time of the Civil War, the American Government adopted the Gold Clause pledging repayment of its debts in " United States gold coin of the present standard of value " even if the dollar should be devalued. This guarantee was applied to long-term loans and appears, incidentally, in Japan's dollar bond indentures. However, on June 5, 1933, a joint resolution by the Senate and House of Representatives made the Gold Clause invalid, and the Supreme Court later upheld the action. In the meantime, the country had suspended the gold standard and devalued the dollar, or in other words had created a situation against which the Gold Clause was supposed to protect creditors, and then had invalidated the clause by force of law. In this way, debtors in America as well as abroad got a considerable benefit at the investors' expense, eventually destroying confidence.

The second great cause of dwindling investments, namely a simple lack of surplus capital, was created by the World War which destroyed sources of capital, and was later aggravated by the economic depression which made the accumulation of capital more difficult. The best yardstick of a nation's ability to lend is the balance of its international payments, and investment beyond the limit of a favorable balance is quite dangerous. Great Britain, for example, had a favorable balance up to 1931, when there occurred a deficit exceeding one hundred million pounds that was instrumental in causing the departure from the gold standard. Before the war Britain was well-to-do with a yearly excess of receipts averaging at about £105,000,000 and annual overseas investments ranging between £120,000,000 and £150,000,000. But "nothing comes out of the sack that isn't in it,'' and as the excess of international receipts dwindled, Britain's investments, likewise fell, reaching £7,000,000 in 1930, nothing at all in 1932, because of a heavy unfavorable balance in the previous year, and subsequently amounting to £2,000,000 to £3,000,000 annually.

Similar conditions have prevailed in America and France. In 1928, the year before the depression, America's international accounts balanced favorably at $725,000,000 but the amount fell rapidly and was only $183,000,000 in 1935, while in 1936 there was an excess of payments amounting to $153,000,000. This phenomenon, coupled with the American people's bitter experience with investment in foreign securities, has drastically reduced the amount of overseas lending. It fell from $229,000,000 in 1931 to nothing in 1934, and in 1937 was only $6,000,000 ; but as investments recently have been made chiefly in Canada, where the dollar is used, they are not, strictly speaking, foreign investments. France's international payments have balanced adversely since 1931, and it cannot make overseas investments without first repatriating its own capital. Three times there has been a flight of French capital and three times it has returned. But France has no money to invest. Following are figures on British and American overseas investments and international payments :

British Overseas Investments : £7,000,000 in 1933 ; £13,750,000 in 1934 ; £6,700,000 in 1935 ; £2,850,000 in 1936 ; £2,100,000 in 1937.

American Overseas Investments : $229,000,000 in 1931 ; $29,000,000 in 1932 ; $32,000,000 in 1933 ; nothing in 1934 ; $48,000,000 in 1935 ; $23,000,000 in 1936 ; $6,000,000 in 1937.

Balance of America's International Payments *(all in her favor)* : $725,000,000 in 1938 ; $447,000,000 in 1929 ; $629,000,000 in 1930 ; $160,000,000 in 1931 ; $131,000,000 in 1932 ; $215,000,000 in 1933 ; $461,000,000 in 1934 ; $183,000,000 in 1935.

Such funds as might be available for employment abroad are often kept at home by a low money rate policy. America has been issuing deficit bonds in large proportions since the inauguration in 1933 of President Roosevelt, who has tried to overcome the financial depression by enhancing the people's purchasing power. Money is distributed liberally at home ; if it were sent abroad, deflation would follow and the low money rate policy would fail. In Britain, the State finances have improved since 1932, and while a certain amount of deficit bonds is being issued, the Treasury and Bank of England do not distribute domestically a large amount of surplus money that the market does not require. The yearly accumulation of national wealth and the money that takes refuge from abroad, together provide working capital for domestic investments and the basis for a low money rate policy. Even if the international balance improves, it is unlikely that the surplus will be invested abroad since the effect would probably be harmful to both the stabilization of the pound and the cheap money policy. Unless a government guarantees the risks involved, investors are unlikely to lend their money abroad under the prevailing international conditions, and the British Government is suppressing rather than encouraging such investments.

A survey of conditions in London reveals that Britain does not depend on £400,000,000 to £500,000,000 of foreign funds on deposit in its banks, which may be withdrawn at any time, but attaches first importance to the money that will remain at home. Since the successful conversion of £2,000,000,000 victory bonds to lower interest issues in 1932, there has been a huge accumulation of domestic capital which has been chiefly responsible for the resuscitation of domestic industry. The British Government does not permit investors to accept any foreign loans excepting the following two kinds specified by Mr. Neville Chamberlain, then Chancellor of the Exchequer, in a declaration of policy made in Parliament on January 13, 1933 :

(1) Sterling issues by a country within the sterling area where the loan is required to increase the sterling assets of that country and so to minimize fluctuations in exchange.

(2) Sterling issues on behalf of any borrower, the proceeds of which are calculated mainly to produce direct benefit to British industry.

Commentators have asserted that the loss on Britain's overseas loans during the past sixty years show the tremendous sum of £2,000,000,000, and that encouragement of such ventures has blighted domestic industry. It has also been contended that too great reliance on investment abroad has caused unemployment to increase and had undesirable effects on the national budget. In any case, Britain could hardly be blamed for re-examining the overseas investment policy it had pursued for more than a century.

The United States has a greater capacity for investing abroad than Britain, but its policy is even more negative. The Johnson Act of 1933 prohibits American citizens from accepting loans from or disposing of bonds for any foreign government or foreign autonomous body with debts owing to the United States Government, under penalty of a fine not exceeding $10,000 or imprisonment of not less than five years. The countries that have ceased paying the war debts, at which the law was aimed, have thus been branded as " defaulters " and disqualified from raising loans in the United States. Finland, the only one of the fifteen debtor nations that has kept up its payments, is still entitled to raise capital and, in fact, is placing bonds there. Japan does not owe one cent of war debts to the United States and is qualified to raise loans. Investors in America, however, have been hesitant even toward domestic corporate debentures since 1933, owing to uncertainty about further dollar devaluation and to the notorious invalidation of the Gold Clause ; and they are also chary of accepting foreign bonds because of the many instances of failure to pay principal and interest.

Consideration is also given to the possibilities that money lent to a neutral nation might, in time of war, be utilized by an enemy country, and to other ways in which loans might operate against the American national interests. The State Department enforces a strict policy against loans that might offend a country with which America has friendly relations, so that if Japan, for example, desired to raise funds there, permission would be denied if it were feared that the feelings of a friendly country might be hurt.

Finally American doubt is due to the risks attendant upon foreign loans. Grown suddenly rich during the World War, the nation began disposing of its accumulated capital by investing abroad, but its methods were unsound and the result was the non-payment of both principal and interest by Latin American as well as European countries. In editorially referring to the failure of efforts by those countries, and incidentally by Japan as well, to arrange short or medium-term credits, the *Journal of Commerce*, New York, in its issue of January 28, 1939, ascribed the failure to the possibilities of disavowal of foreign loans by dictatorship nations, the enforcement of exchange control, and the

(Continued on page 228)

Something About Kedah

By TUNKU NONG in The Asiatic Review

If I am asked by a person, who is interested in the Malay States and who has never been east of Suez, to tell him something of Kedah, one of the five Malay States which are not federated, I would feel inclined to begin, quite in an irregular way in an article of this type, by telling him something which has no direct relation to the main subject. Robert Foran, in *Malayan Symphony*, writes of Kedah, "This section of the Peninsula gives the impression of having been woefully neglected." He, however, admits that he might be guilty of an injustice in saying or thinking so, as he only saw Kedah from "a railway carriage window." I do not blame him for deleting Kedah from his tour. After all, he was not the first to do it, by any means. It is usual for an average visitor to the Malay States only to see Penang, Singapore, and that stretch of some four hundred miles of mainland lying between those two ports. He thinks that he has seen enough of the country, not knowing that he has missed the more fascinating parts; I mean the States on the east coast in which perhaps my own Kedah may be included, where real Malay life, custom, and harmony prevail.

Let us be more patient, and take a train from Penang through Kedah to its most northerly point. Some of you would be satisfied with the remark, "You are now in Kedah," because Kedah is perhaps the least striking State from a train. As soon as you have left Province Wellesley, the strip of land lying adjacent to the island of Penang, which is included in the Penang administration, you see rows and rows of green rubber trees until you reach Sungei Petani, a town halfway between Penang and Alor Star. In Kedah it is only second in importance to Alor Star (20,000 population), which is the capital. After Sungei Petani one sees a short range of hills, although in the language of the people they are "mountains." This range has been called "a freak of Nature," even by lovers of the State. It should not be there, but it is there. It is as majestic as any short range of hills can be. Seen from the east coast of Penang, it is a wonderful advertisement inviting people to Kedah. To the sons of Kedah it is their pride. Kedah Peak, the highest elevation, is very nearly 4,000 feet high. The natives call it Gunong Jerai—a name which is connected with the history of the old kingdom of Kedah. A popular Malay legend about Kedah's cannibal king, Mĕrong Maha-Wangsa, makes Jerai or Cherai his habitat. There are a few more legends from Gunong Jerai, but as the train would not stop we proceed on our journey as usual, covering thirty miles an hour at the best, as we are going into a very flat part of the State, and "safety first" over a line that is laid on once a marshy land means "less speed."

Between December and March you would see what might be described as an ocean of paddy-plants, from which you get rice, the staple of most Eastern countries. A few weeks before harvest time the plants change to a golden color, very much like wheat or barley. Here and there you would see a Malay village, which you would at first take for a thicket. So the scenery dances past before you. It might be described as typical, until you are near Alor Star. You become hopeful, and wonder if you are going to see a couple of tigers in the streets, and gorgeous temples. You raise your hopes too soon, because you would not see the sign of a tiger until you go at least twenty miles into the interior of the State. That is, of course, if you are lucky. Beautiful temples do not exist in Kedah. You are thinking of Burma and Siam. What you see on your right, apart from bungalows, and black-and-white barracks for the coolies which belong to the F.M.S. (the Federated Malay States), is a group of buildings, Sultan Abdul Hamid College, named after the Sultan who has left the government of the State to his eldest surviving son. It is the biggest school in the State, and gives English education from primary to School Certificate standard. On your left you see some football fields, and a row of houses on both sides of the road. What you see of Alor Star from your carriage window as you cross the level-crossing is one straight road, and some brick shop-houses. The train then gradually speeds up for the north and Siam. All along you will find more paddy-fields, and occasionally coconut trees. So, as you are passing through Kedah, you perhaps say to yourself, "I think I have seen all I want to see."

For those to whom Nature is irresistible, and who are interested in the modes of living of the Malays, it is advisable to venture a little further. I would invite them to Alor Star, and show them those parts which are rarely reached by the average visitor, and explain to them the life of the Malays, especially of Kedah.

Kedah (about 3,700 square miles) has a population of 400,000, and here, unlike most of the other States, the Malays form the majority. No two States are really alike. Fashions, dialects, and even mentalities differ somewhat. While in the heart of Singapore a visitor to Malaya might feel as if he were in the Strand or Oxford Street, and in Trengannu or Kelantan he is in a strange world, in Kedah his mind is probably undecided. There is something about Kedah that is different from any other State. Its people are different, more conservative, and perhaps more religious than some others. The Malay they speak is pure and unaffected, though apology must decidedly be tended for the babel at the car parks, railway stations, and the non-Malay shops. No doubt the so-called bazaar Malay is easy for a beginner to understand and talk, but it is not Malay, or even worthy to be called a simplified Malay. It is rude in construction and most unpleasant to listen to. The boys in the streets speak it, and it has even penetrated into some respectable homes in the country.

The Kedah Malays are proud that they are born in Kedah, and they wish to see that it is second to none. Talk to a Malay youth and ask him how he likes his State to be? He would tell you that he likes to have it to himself, in the first place. He likes to see its capital big and beautiful. Although he may have very little knowledge of world economy, and the extremely intricate trading transactions with which he is not at all familiar, he can understand that the prosperity of a country depends on the activities of internal industries and external trade. He is beginning to realize that, and there is something at the back of his mind that is telling him that his country should have some big factories. He is not contented with living on the richness of the soil and the other facilities Nature grants him. It is a sure sign that he is prepared to make a more rapid progress, but to those concerned I would commend a steady natural way, which requires great understanding of the situation and, what is more important, sympathy and understanding of the people's mentality.

It is generally true, particularly so in Kedah, that the feelings of the people are easily hurt; but once you have won their confidence they can be stout John Bulls. There is a book by Sir Frank Swettenham, *British Malaya*, which I commend to those who really want to know more about the country in general, and in Dr. Winstedt's book the pictures alone would give you some idea what to expect when you visit that part of the world.

We have wandered from our course, and must return to Alor Star, on which are focussed the several aspects of Kedah Malay life. To understand the changing Kedah you must necessarily study Alor Star, from where Civil Servants are sent out to the different corners of the State. For a Malay town none can be ashamed of it. It has a mosque, which is supposed to be one of the best in the country, and the House of Audience, Balai Besar, is certainly worth a visit. The other outstanding buildings in the town are the lovely bridge that goes over the Kedah River, the Tower of Royal Music, Balai Nobat, and the High Court. The Sultan lives in a quiet, cool, and unpretentious palace. That is all the grand old man wants. There he lives by himself, and around him in their individual residences are his sons and daughters. Although he has passed his seventieth year, he regularly goes to pray in the mosque on Friday, the Islamic Sabbath day, and other special days. His people regard him as a saint, and there is hardly a home that does not have his photograph. They speak of him with reverence, and, although he has no hand in the government, the Malays believe that the destiny of the State is always guided by his blessing. So long as he lives they have no need for fear. As much as George V. represented the British nation, Abdul Hamid Halimshah is the very personification of his subjects.

Perhaps you have heard of the landing ground for aeroplanes at Alor Star. Kedah fully realizes her position in the country as a member of the Empire. Extensive paddy-fields have been converted into an aerodrome about seven miles outside the town, and accommodation has been furnished for regular air passengers and occasional visits by the Royal Air Force. The people are growing air-minded, whereas only about six years ago very few homes had ever heard of an aeroplane. The stories their fathers used to tell them about those marvellous boats were not credited.

Let us leave Alor Star and visit a Malay village near the aerodrome. The chieftain is usually elected for his popularity, and is one of the elder statesmen of the village. He is a married man with a few children. When they were young he sent them to the village school, and he keeps them busy until they are old enough to look after themselves and get married, by training them in the cultivation of the land. All the money he, his wife and children need for clothes is obtained by selling their surplus rice and the fruit that they grow in their own orchard. Nowadays all over the country, in every district, there are fairs where the village people gather to buy and sell. The object of these fairs, perhaps, is to instil in the minds of the people some rudimentary ideas of business. The Malays in Kedah, very much more so than in some other States, have hitherto had very little idea of converting their surplus into cash. They have no desire to be rich, nor the least necessity to grow foodstuffs for their fellow-countrymen in the towns. They are now beginning, however, to come more often to the towns and buy such luxuries as shoes, fancy cups, and cooking utensils. Malay families in the villages have started to use the fashionable napkins and Damask tablecloths, spread on the floor and not on tables, and drink scented tea out of glasses. Table lamps have taken the place of the old-fashioned home-made tin lamps. This short catalogue of the changing Malay homes, I hope, convinces you that however slowly the effects of Western civilization may be working in Kedah, yet they have already been established. The people are not slow to seize the opportunity of being gay and bright. Watch them when they go to the places of amusement at Alor Star and the other big towns, how gaily they are clad, and how easily they are pleased!

Not so long ago the farmers used to send their sons to the State school to obtain English education in the hope that they would be absorbed by the Government. The Government has now made it clear that it cannot possibly take everybody with a School Certificate, and the fathers who wanted to see their sons dressed in white English suits and earning some regular money resented this at first. The Education Board is making education at the vernacular schools more attractive, and scholarships to deserving boys are awarded annually and in a liberal manner to further their studies. Malay craftsmen of to-morrow are being guided and properly trained, and to point to another fact worthy of the British policy, the village schoolboys are being taught to appreciate their own language and culture which for many years have been unfairly neglected. The time will soon come when Kedah boys will be qualified in the various activities and callings. Kedah Malay journalists, Kedah Malay business men, and so on, will shoulder the responsibilities of their own State. The mass of the people are just emerging from a long illusory dream. When they can see true daylight they will not be disappointed, because the State is not lacking in beauty spots, or space for them to play in and experiment. Kedah is not crowded.

Langkawi and the surrounding islands have been recognized as useful health resorts. Langkawi has a very beautiful natural harbor. I can never forget the first time I saw the island as the boat steamed towards it. I would have to travel far and wide to strike a scene that could beat it. Kedah can always be very proud of that treasure isle!

There are three beautiful waterfalls on the sides of Gunong Jerai, about twenty miles south of Alor Star. Year by year they are drawing more and more excursionists and visitors. If the visitors think that waterfalls are very much alike, I would suggest that they go to the eastern districts of the State, where they can have a glimpse of Malayan forests, and if they are lucky might meet some aborigines, the Sakais, who have short curly hair like the negroes of Africa, quite 4,000 miles away. Their physical features are almost perfect, although they are, as a rule, small in stature. Those whom you would encounter can generally speak Malay, with a broad country accent.

At the end of all these travels you would probably like a bathe in the clear stream at Baling, the chief town of Baling district. Bathing is perfectly safe here. Crocodiles do not live up the stream, and none of the rivers in Kedah are like the Congo River, or any of the rivers you see on the screen that are infested with crocodiles.

If the late afternoon is fine, as it usually is, you can go for a spin, and enjoy the cool fresh air. Kedah, like the rest of the country, can offer you plenty of that. The fresh appearance of the entire State might lead you to think that it is young, and has little or no history. Let us therefore return to Alor Star, and from there go to a fishing village about six miles outside it, at the mouth of the Kedah River. Kuala Kedah, as it is called, is a busy village. It supplies Alor Star, its suburbs, and the neighboring towns with fish. The thatched houses here stand on numerous pillars, half of which are in the water. We cross by a "prahu," a small Malay boat, to the other side of the river to the lighthouse, which is surrounded by an old fort, and on its walls there are some cannon which are held in religious awe by the people. The Malay who keeps the lighthouse is only too pleased to tell you of the battles that that spot witnessed or took part in. You must show him your heartfelt sympathy, that is the only thing he expects from you. The ancient glory of Kedah was tarnished, and no Kedah Malays expect any other requisite than the goodwill of the peoples of the world. Our friend the lighthouse keeper would not tell us that absolutely true story of past bloodshed. He rather rests on the achievement of the canonized gun. He would tell you that countless invaders were killed. No mention of the losses on the side of his ancestors is made, although he might tell you that during the most intense fighting there was so much blood within the fort that people could swim!

That story is probably handed down to him by his father, but he would be pleased with you if you could at the appropriate time show some expressions of surprise and awe. When a Malay strikes upon a serious subject like that, do not laugh at him, however much he may appreciate good jokes and a good and hearty laugh! For the history of the country, and of Kedah, we must turn to the books. *Hikayat Abdullah* does not pretend to be a history book, nor even a descriptive record. For the more planned history we must turn to scholars like Dr. Winstedt, who has spent the best part of his life in the services of the country. I sincerely recommend his latest book on Malaya for more details. He will convince you that Malaya is not lacking in history, and there are two interesting chapters which are associated with the old Kedah. The brief account which I am offering you in the subsequent paragraphs does not pretend to give you more information than Dr. Winstedt's *A History of Malaya*.

Apart from the story of Mĕrong Maha-Wangsa, Kedah's cannibal king, which has become a legend, there is genuine history of Kedah with enough evidence to prove its genuineness. This goes as far back as the later middle ages. For the present, let us see how much of the lighthouse keeper's narrative is true.

Every educated Kedah Malay knows that at one time Penang, now a Crown Colony, belonged to Kedah. As Penang has grown in importance and size, there is bound to be a certain amount of jealousy between the people on both sides of the channel. Penang has become progressively separated from Kedah, chiefly perhaps because on the island the Chinese and Indians dominated the Malays. Education cannot have turned the Penangites, a word sometimes used by the Penang newspapers to describe its inhabitants, snobbish and forgetful of their origin. The Malay scholars take it more philosophically, and their feelings cannot be better expressed than by quoting the words of Awang Sulong Merah Muda in a story which Dr. Winstedt calls *Love Among the Islands*:

"Pulau Pinang bandar-nya baharu,
Kapitan Light mĕnjadi raja,
Jangan di-kĕnang zaman dahulu,
Dudok mĕngalir ayer mata."

I would rather leave you with the original than attempt to translate it. However, I am sure Kedah can justifiably share some pride with Penang. Before Captain Francis Light founded the island, trade with India and China terminated on the mainland, in Kedah itself. The old kingdom of Kedah was roughly three or four times greater than the present-day Sultanate. It had an extensive supply of tin, pepper and elephants, however incoherent these names may sound, and she owed her prosperity mainly to them. The Malays have always had the worst in business transactions, due to either the greed of the ruler or the trading incapacity of the people. They still have much to learn of the peculiar ways of trade and commerce.

One can hardly expect a small State like Kedah to manage its financial affairs as well as its politics. While the king did not find it difficult to govern—for the feudal system worked extremely well in Kedah as in the rest of the country—he was from time to time confronted with outside threats and the unreasonable demands of his neighboring rivals. Siam was Kedah's greatest problem. Before the East India Company extended its interest as far as the Malay States, the kingdom of Kedah was under Siam's suzerainty. Kedah paid tribute to the king of Siam in gold annually. On the top of all this she had to deal with the Dutch attempts at intervention and, what was more serious, attacks from the Bugis, then very formidable invaders. Fortunately for the depressed State, the Dutch episode did not leave a permanent mark, while the Bugis remodelled her policy to their best advantage, sharing with Kedah the revenues from the sale of opium, tin, wax, timber and rattan.

Events took another turn when Captain Light in 1771 made arrangement with the Raja of Kedah for the occupation of a port in return for help against the Bugis who had overrun Selangor. The Raja was forced to oppose the scheme when he found that the Hon. Edward Monckton's terms did not include aid against the Bugis. However, when the need of a harbor somewhere in the Archipelago was realized, Captain Light opened fresh negotiations, which took nearly a whole year before they were concluded. On August 11, 1786, Penang ceased to be a part of Kedah. $10,000 in Straits currency annually for eight years, and subsequently $4,000 per annum as long as the Company held Penang were put forward as terms for the agreement. Because it did not mention anything about helping Kedah in case of Siamese attacks, the Raja then was not free from fear and misapprehension, Light's offer was rejected, and a force headed by the Raja himself went down to Prai in an attempt to regain Penang. Although his army outnumbered Light's small force of 400 men, the latter's clever tactics resulted in the signing of the Treaty of 1791 by which the Raja ceded Penang to the English Company, and in return was paid a sum of $6,000 annually as rent. Later the Sultan left us to conjecture, when he gave to the Company the strip of land which is now called Province Wellesley for an annual rent of $4,000. It was the need of money perhaps, more than anything else, which induced the Sultan to take such a desperate step.

Siam regarded it as a deliberate effrontery when the Sultan refused to go to Bangkok. In November, 1821, a Siamese fleet was sighted off Kuala Kedah, where there are still the remains of a brick fort. The commander gave order to his men to get ready, while the Bendahara and the Laksamana with a small body of men, when they threatened the invaders were pitilessly slaughtered. The Laksamana, the Malay equivalent of a War Minister and General, was the very symbol of Malay bravery and doggedness. The Bendahara himself was a man noted for his daring deeds. You perhaps remember the lighthouse keeper extolling the qualities of these two brave men. The Malays without a trusted leader from whom they could derive their inspiration, resisted blindly, and the Siamese did not find it difficult to suppress them. The victorious fleet attacked the Merbok River on which the next big town of Kedah, Sungei Petani, now stands.

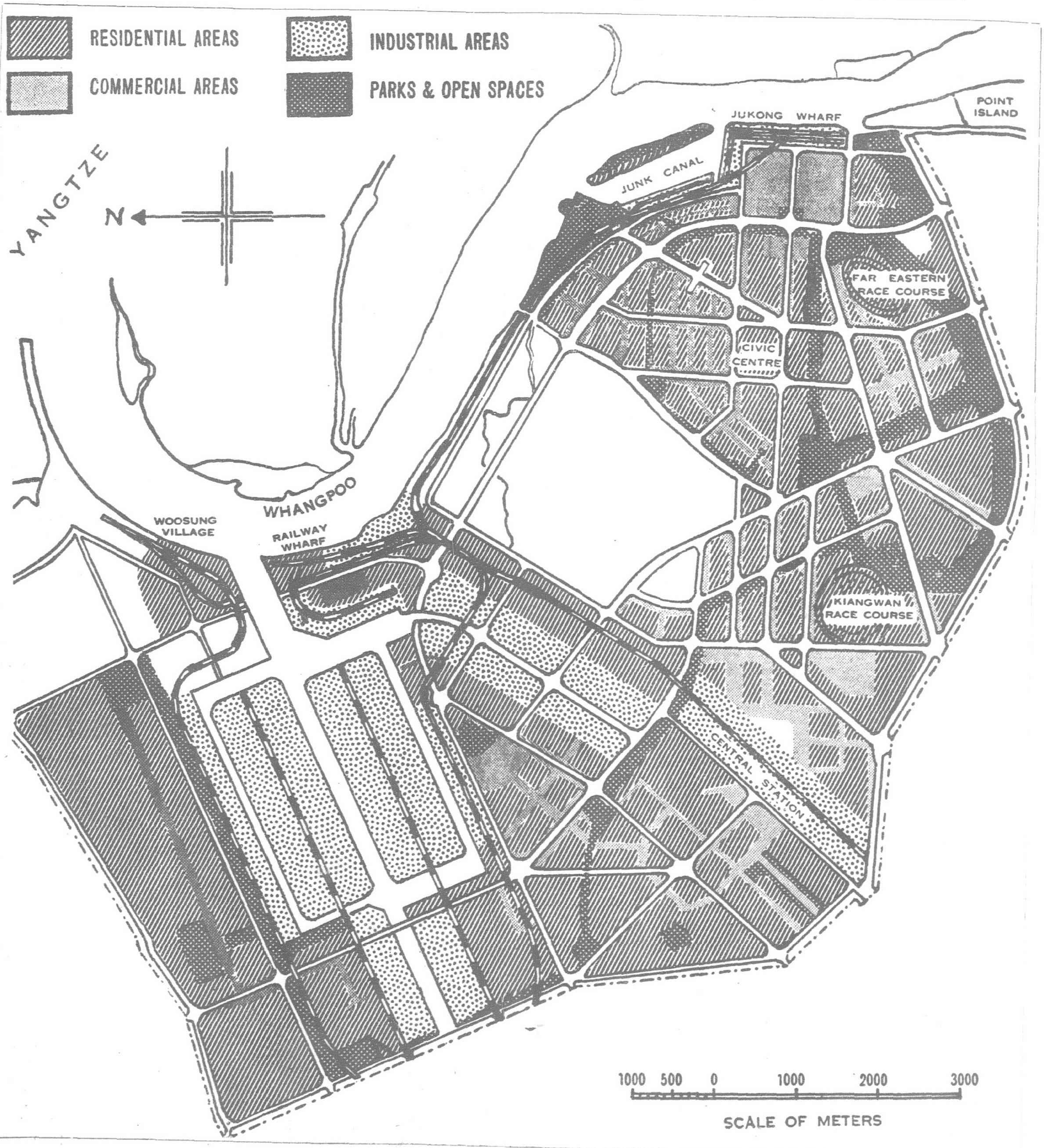
The Sultan and his followers fled to Penang to save their lives. Ahmad Tay'udin Halimshah, for that was the name of the Sultan, was bent on regaining his throne by fighting. In 1823, about a year after the defeat, Tunku Abdullah, the Sultan's son, at the head of some 30,000 Malays attacked the Siamese, but without success. Negotiations were carried on instead, and the Governor of Penang took a great part in them. In the meantime the Sultan was a prisoner in Penang. In April, 1831, Kedah was attacked from Province Wellesley, and the Siamese force was dispersed. Tunku Kudin, the unlucky Malay prince, became vice-regent, and his fickle policy invited another Siamese invasion on a grander scale. Tunku Kudin, with the heart and stubbornness of a Malay warrior, resisted it. In October, 1831, the Siamese dealt their final blow, and accounted for the destruction of nearly 2,000 Malays. Kudin himself was killed, and perhaps the Malays of Kedah ought to be grateful that he went. Whether the stories of his cruelty which are handed down to the children at home are to be taken as facts or not we cannot now decide, but there was no doubt that Kudin could not have been the ideal ruler for a shattered country. 1838 was a very lucky year for Kedah. Her fleet drove back the Siamese and relieved the fort which was held by those invaders. You perhaps remember what the lighthouse keeper said of the bravery of the Malays. Kedah seized Perlis and Trang, but at Singorra, after an ambitious ravaging foray, the force was repulsed and driven south to its own territory. Kedah's luck was not long-lived, for Chua Phya, with a Siamese force of 1,500 men, swooped on the State. It became clear to the exiled Sultan that his lost throne would be irretrievable if Kedah and Siam were to go on fighting, and by this time the latter grew tired of constant fighting, and her officials left Kedah. The Sultan returned to his State, although many of his dependencies, like Setul, now included in Siam, and Perlis, an independent State under its own native Raja, were surrendered. After these troubled years and when Siam adopted a more humane attitude towards Kedah, the State enjoyed a period of prosperity. At the close of the nineteenth century she became extravagant, and her expenses far exceeded her revenues, perhaps to a large extent on account of the dishonesty of petty officials and the village chieftains, or even the extreme liberality of the prevailing administration. In 1905 she was compelled to borrow about $3,000,000 to stave off bankruptcy. Siam went a step further by nominating a special adviser to supervise Kedah's finance. That year is also memorable because a State Council was formed. It was the nucleus of the present-day government of Kedah. In it the people of the State feel their security lies, and on it their patriotism and services are based.

In 1909 Siam passed the four Malay States, which include Kedah, to British hands. Kedah, like her neighbors, accepted a British adviser, who is an important official in the State. He advises the Sultan in matters of foreign policy, finance, education, and the general government. Religion and customs of the State, however, are outside his sphere. These are important facts to remember, because the easiest way to embitter the feeling of a true-born Malay is by interfering in questions touching his life and means of living. Let the Malays live as they like, and you need not doubt their patriotism. They only stick to those they love, and to win the admiration and love of a Malay you only have to show him your sympathy and understanding of his needs, his mind, and his ways. He is full of philosophy, and simple and honest thoughts. He is, as a rule, open-hearted, merciful, and cheerful. You might ask why he is philosophical? The truth is perhaps because he hates a rush and sudden revolutions. If he has a plot of ground to till and grow his rice, and a river to fish in, he is content. Most of his leisure hours are devoted to silent thoughts. He faithfully believes in a God, and that He guides his destiny. There is nothing that Man has achieved, he thinks, that has not met with the approval of God. It is only when Man tries to be above Him that he meets his downfall. He fully understands that community life is absolutely necessary in a country like his, and, much as he welcomes comfort and progress, he would not do away with his ancient practice and customs which have stood the test of time.

Kedah is an interesting State to study, because while changes are going on rapidly in the towns, the villages still cherish the old order. While the thoughts of the town people are in a stage of transition, the Kampong people are still living the lives they have lived from the time when they were first conscious that they were Malays of Kedah. The peaceful and contented atmosphere of the State cannot fail to attract the attention of a sympathetic traveller. For many years she has been able to balance her own budget, and show a surplus. She has progressive elements. She is educating her children, and making a comfortable and safe home for them. The younger generation are proud that they belong to Kedah. It falls to the lot of the British people to be at her helm. I can only assure them that the Malays of Kedah are not lacking in gratitude.

The New Shanghai of the Future

The construction of a Greater City of Shanghai was originally planned by the Kuomintang Government in order to meet the future great development of Shanghai. The French Concession and the International Settlement, which constitute the City of Shanghai with only the exception of Chapei and Nantao, have grown into the present great metropolis in the long course of a century, and naturally they have great defects as a modern city, as it was not first planned with an eye on future development. This accounted for the grandiose plan of Greater City of Shanghai launched by the Chinese Government.



Plan of the new "Japanese Shanghai" *Courtesy The N.C.D.N.*

The above map, showing various building zones and approximate location of street and park areas, has been issued by Japanese authorities to illustrate plans for a "New Shanghai" destined, if all proceeds as expected, to rise on the banks of the Whangpoo River in the vicinity of the Civic Center and Woosung

Geographically speaking it was quite appropriate that the new Civic Center district was selected as the focal point of the New City, for the best facilities for the junction of land and water transportation must be taken into consideration for an ideal international Port and Metropolis.

The Reformed Government and the Special Shanghai City Government, therefore, have decided to carry out the original plan of the Chinese Government and to adopt the Civic Center districts for the site of the New City of Shanghai.

Plan for Construction

In March this year an outline of the plan for the construction of the New City was published. This plan belongs to the first period which is spread over fifteen or sixteen years.

In compliance with the request of the Reformed Government the engineers of the Home Department of the Japanese Government and those of the Army made land surveys and built schemes on the basis of which a plan was first drawn, and sent to the Reformed Government for approval. The latter in co-operation with the Engineering Department of the Shanghai Realty Company carefully examined and improved it. The draft plan was finally studied by the Advisory Committee for the Construction of the City of Shanghai, consisting of officials representing the Reformed Government, the Shanghai Special City Government and the Shanghai Realty Company. The committee approved the plan after minute inspection.

The construction work will be done under the supervision of the Reconstruction Board belonging to the Home Department of the Reformed Government, and under direct control of the Shanghai Special City Government. The work is being executed by the Shanghai Realty Company with the help of the public utilities companies belonging to the Central China Development Company.

The construction work is apportioned to the Shanghai Realty Company, and the other companies as follows:

(*a*) Roads, sewerage, parks the harbor, the canal, etc.—The Shanghai Realty Company
(*b*) Waterworks, electric power, etc.—Huwa Chung Waterworks and Electricity Company
(*c*) Gas-works—Greater Shanghai Gas Company
(*d*) Railways—Huwa Chung Railway Company
(*e*) Communications—Huwa Chung Electric Communication Company
(*f*) Transportation—Huwa Chung City Bus Company

For construction of roads, harbor, canal, residential buildings, etc., other companies of special lines will undertake the work in accordance with the plan drawn by the Shanghai Realty Company.

Details of the Plan

The plan which belongs to the first period covers an area of 4,570,000 square meters extending from Woosung to Kiangwan in the south with the former City Government site in the center. It makes a radius towards the mouth of the Soochow Creek. The whole area is divided into the following six quarters:

(*a*) Government and public zone
(*b*) Residential zone
(*c*) Commercial zone
(*d*) Industrial zone
(*e*) Mixed zone
(*f*) Warehouse and godown zone

Amidst these zones are dotted parks and green spots. The Government and public zone covers a tract of land with the present City Government as the center. All government and public institutions will be built in this area just like Marunouchi in Tokyo. As regards the residential zone, high class residences will be built in the area surrounded by the government zone and Gojo-ga-tsuji, and general residences in the area around the industrial and commercial zone. The commercial zone will be divided into the big business center, and the general shopping center. On the land confronting the Chuikiang Wharf will be built modern sky-scrapers. In the outskirts of the high-class residential zone and the Industrial and Residential zone and also in the land surrounding the Central Railway Station a general shopping center will be constructed.

The Industrial zone will be divided into the heavy and light Industrial Sections, and the area extending from Woosung westwards will be used for the purpose. Another light industrial zone on a smaller scale will be built in the area extending from north to south. For the warehouse and godown zone the land adjoining the Chuikiang Wharf and the harbor section is apportioned. The tract of land behind the Central Railway Station will also be used for the zone.

The most important point of the New City planning is the construction of a great harbor extending from the mouth of the Whangpoo River to the center of the heavy industrial quarter. As steamers of ten thousand ton class can enter the harbor, not only does it facilitate the supply of raw materials directly into the industrial zone, but it will afford great convenience for shipment of outgoing manufactured goods.

A grand canal connecting the harbor and Lake Taihu will be built by enlarging Woosung Creek. Big junks ply this canal and serve for sending raw material from the interior regions and for distributing goods fresh from the factories to the interior regions.

The railway connecting the Chuikiang Wharf, and the railway jetties by an outskirts line reaches the Central Station and it is also joined to the Shangha-Nanking Railway at the shortest distance. The present North Station is therefore destined to become a small station of a branch line.

Chuikiang Wharf is planned for trading purposes. After the railway construction is completed foreign importers and exporters will have to utilize this wharf. Traders of British and other nationalities utilizing the wharf at the Bund will save traffic expenses by about Y12,000 per 10,000 tons if they discharge their goods at Chuikiang Wharf.

For the railway jetties a site has been selected which can afford the best facilities for transportation of raw materials to the factories, thus enabling a great reduction of cost for production of goods. Adjoining Chuikiang Wharf there will be built moorings for big junks.

Construction Work Proceeding

As is stated above the plan already published belongs to the first period extending over 15 years. And the construction work, covering one-third of the plan, which takes about six years, has already been started.

The work to be accomplished during this shorter period consists of the purchase of land covering 30,000,000 square meters at the cost of Y30,000,000 and construction of roads, parks, etc., at the cost of Y85,000,000.

Purchase of land is not compulsory as far as third power nationals are concerned, while all Chinese land-owners have sold or consented to sell their holdings. Those third power nationals who do not part with their property will be expected to share the expenses for the construction of the New City as beneficiaries. The land necessary for the City planning is being acquired by the Shanghai Realty Company or by the Reformed Government which will deliver the purchased land to the company.

The company sells or rather rents on a lease of 20 years the expropriated or purchased land to the general public. Those who rent land from the company are expected to establish buildings within three years. Anybody or concern irrespective of their nationality can lease land. Those whose buildings now stand on the expropriated land have a priority right to lease the land.

The Shanghai Realty Company has already set about construction of roads and residences. At present the Road Matsui-Dori which connects the New Civic Center and Dixwell Road, and the road to Tatangchen are being paved by the Koya-gumi works. With the arrival of necessary material the work of enlarging the roads in the New Civic Center will be commenced.

Residences will first be constructed on the tract of land covering about 200,000 square meters with Gojo-ga-tsuji as the centre. And as a first step one hundred residences will be built by the Toa Gumi Works for the members of the companies connected with the government. The land for this residential zone will be rented to the general public in the near future.

At present electric power and water is supplied to the new Civic Center districts, and their further supply will be made with the progress of building of roads. As to gas supply, necessary material has already been prepared in Japan, so that works for gas supply will be started with the commencement of road-construction on a large scale.

The construction of a harbor will be undertaken by the Kobe Harbor Construction Company. The construction of moorings for junks near Showa Island is already proceeding. The part of the harbor situated near the industrial zone will shortly be improved by the same company.

As regards the construction of the industrial zone the necessary survey has already been completed and the allotment of land for factories will be shortly made. A large number of both heavy and light industrialists in Japan as well as in Shanghai are applying for lease of land. The government will make a strict selection of the applicants and priority will be given to those industries which are most public-natured, and full of promise for future development in Central China.

The first factor which may slacken speedy progress of construction work for the New City is the difficulty attending transportation of building material owing to the shortage of bottoms. The second factor is the limit placed upon the use of building material, for the obtaining of material for the construction of the Shanghai City must be done within the scope of the general plan for mobilizing war material, which is being enforced in Japan. The third factor is the shortage of capital. It is estimated that at least several billion yen will be needed for completion of the plan in the first period. The control of economics in Japan does not now permit investment of such a huge amount of capital for the plan.

Administrative and Judicial Power in the New City

It is authoritatively learned that the Reformed Government will exercise administrative and judicial rights in the New City of Shanghai while the maintenance of peace and order will be carried out by the Japanese forces during the transition period. Concerning the management of public utilities and institutions, taxation, etc., an agreement of opinion has already been arrived at between the Japanese Government and the Reformed Government, while the technical details for municipal affairs are being studied by the Asia Development Board.

The Shanghai Realty Company

The company which was inaugurated on September 10, 1938 has a very important rôle for the construction of the City of Shanghai. The company is a Chinese juridical entity, and is a Sino-Japanese joint concern. It has a capital of Y20,000,000 half of which the Reformed Government has subscribed in kind, i.e., in the form of government land, buildings, etc., while the remaining ten million yen (half of which is paid up) is subscribed by the Central China Development Company. The capital is represented by 400,000 shares (Y50 per share).

The Company is entrusted by the Reformed Government with the work of constructing the new city of Shanghai. The following are the items of business to be undertaken by the company:

(*a*) Construction of the City
(*b*) Harbor construction
(*c*) Purchase, renting, utilization and supervising of land
(*d*) Trust of real estate
(*e*) All kinds of business connected with the above four items

The company is authorized to issue premium-bearing debentures to the maximum amount of Y100,000,000. The government guarantees the redemption of the debentures, and payment of interest. If the dividends of the stock shares of the company do not reach six per cent per annum of the paid-up stock, excluding the shares subscribed by the government, the government will redeem the deficit. The president of the company is Mr. Chen Shao, a Chinese subject, and Vice-President Mr. T. Araki, a Japanese subject. There are three Directors, all Japanese, and one Chinese Inspector. The business of the company is undertaken by the three departments: General Affairs, Land and Technique.

The main offices of the company is at No. 1 Ashuili, North Szechuen Road, Shanghai.

As stated, the construction of a new city of Shanghai has been undertaken with a view to cope with the future great development of Shanghai through the increase of population and the expansion of industry and commerce. Speaking of the Japanese population alone it is expected to be increased to 300,000 in ten years. As to the reconstruction of the Chapei and Hongkew districts, this will only be undertaken in future for the purpose of connecting the New Civic Center and the International Settlement. But this is outside of the scope of the plan under review. The reconstruction of Nantao and the Western districts will also be confined to minimum limits.

It is a matter of course that third power nationals' collaboration financially and otherwise will be welcomed for the construction of the New City since they will also be participants of the benefits accruing from the New City. It may be that third power nationals hesitate to invest capital in the New City simply because they do not enjoy extraterritorial rights there since it is not a concession. However, full measures will be taken for the protection of their rights and interests by the Reformed Government, and as to the defence of the city a plan will be established which will assure the maintenance of peace and order and protection of the citizens against invasion of guerillas or disturbance.

Prospects for International Borrowing

(Continued from page 222)

uncertain international situation in which economic nationalism is supreme. The rejection of Japan's proposal, if any, was probably due mainly to the last-named reason. At the same time it is highly gratifying to note the outstanding tribute paid to Japan in the annual report of the Foreign Bondholders Protective Council in America, issued on June 27, 1937, which says that the Japanese Government still owes directly $181,977,000 of debts to the United States Government, and indirectly owes $48,986,000 of debts in the form of three kinds of Government-guaranteed bonds issued by Japanese institutions. The report then points out that Japan has ever and unfailingly paid both the principal and interest. This high standing with American investors is a valuable asset to Japan and must be retained by all means.

In conclusion I shall briefly discuss the future prospects of international investment. As a lack of accumulated capital and the increased risks, broadly including exchange control, are the chief obstacles, it follows that before investments can revive, the economic strength of creditor nations must be increased and, what is equally essential, peace and stable international relations must be restored. However, economic liberalism has vanished; the world is dominated by economic nationalism which is gaining strength. Therefore, even with peace and the recovery of large investor countries, nationalism will probably prevent free overseas lending despite the tradition that investments follow safety and profits; and Governments will probably prevent investments in countries of opposing diplomatic policies. A sort of political investment activity will continue. For example, France at present lacks strength to invest abroad and is borrowing from Britain, Holland and Switzerland on a short-term basis and under humiliating conditions to supply the deficit in its State finances. Yet France continues to lend money on a credit basis to Poland, Rumania, Jugoslavia and, until recently, Czechoslovakia. Another example is the assistance which Britain extended to China's economic development prior to the China affair, and her dispatch of Sir Frederic Leith-Ross to make an economic investigation.

The tendency of investments to go with the flag, which is already visible, may be expected to continue. Consequently rich countries will not invest in nations whose interests are not similar, despite their economic strength. The interests of Japan and Great Britain do not coincide at present, and so it is quite possible that the British policy of avoiding investment in Manchoukuo, North, Central and South China, which are included in Japan's continental program, may become even more pronounced.

The factors of profits and security, which guided international investment prior to the World War, have been subordinated to the factor of national policy which, under the changed world conditions, will retain its importance. All this is of vital importance to the Japanese people. They must not lose sight of it even for a moment in participating in the future economic development of East Asia.

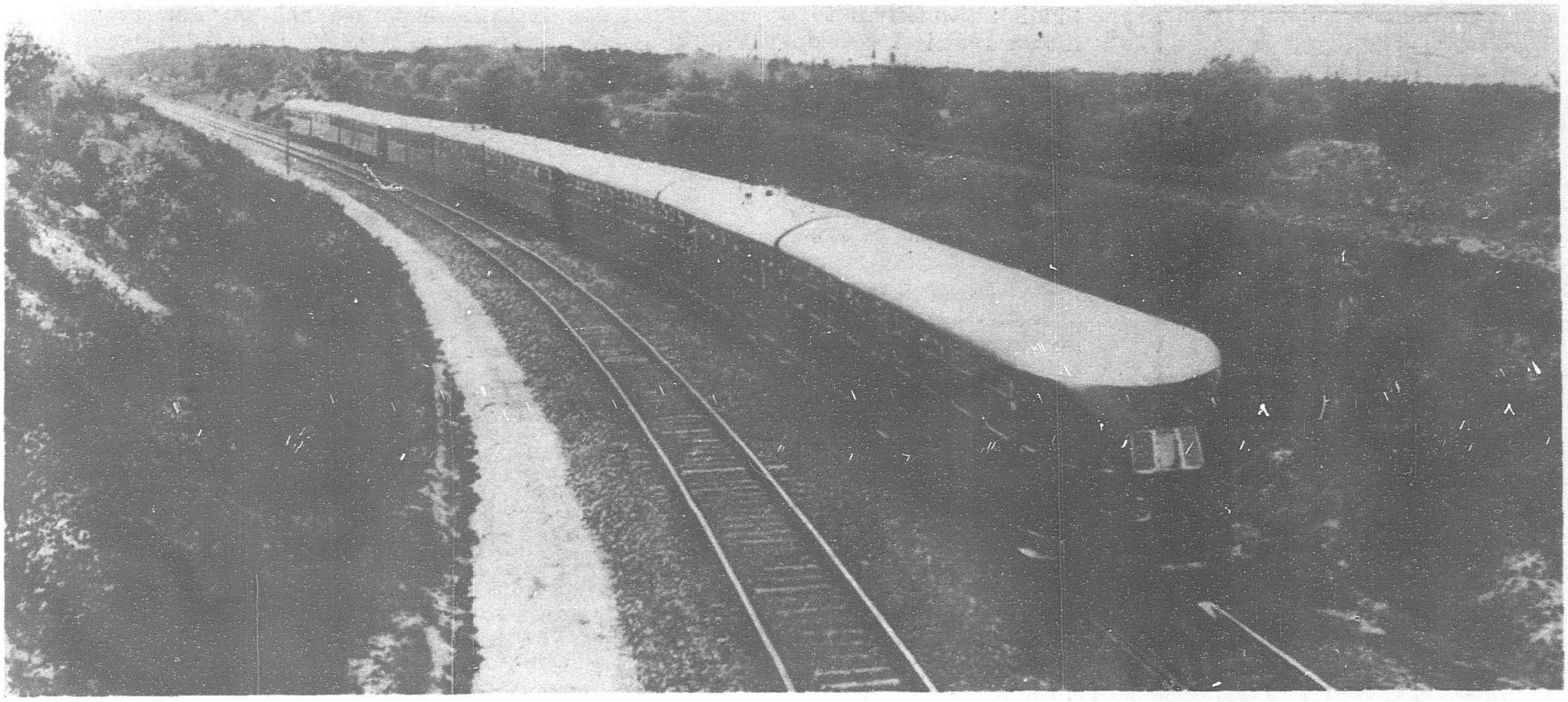


Fig. 1—Three coupled three-coach railcar trains of The Netherlands State Railways in service and running

The Railcar Changes the Face of Traffic of a Country

The article presented here shows how The Netherlands State Railways have made use of the railcar as a means to obtain higher travelling speeds at greater train frequencies. With a view to further traffic development and to increase travelling speed, a number of still larger railcar trains will be put into service in the Spring of 1940.

The Netherlands State Railways in 1938 placed an order with Maybach-Motorenbau, G.m.b.H., Friedrichshafen for no less than 63 Diesel railcar engines of the latest type with an output of 600/650 b.h.p. This followed an earlier original order to the same company in 1933 for eighty 410 h.p. Maybach diesel engines for railcar traction. The order placed in 1938 for the larger engines, totalling about 40,000 b.h.p. established a record at that time as the largest single order for diesel engines for railway traction ever given. Some time later, however, an even larger order was given to Maybach-Motorenbau from the German State Railways, this being for 89 engines of the same type.

The railcar programme of The Netherlands State Railways has extraordinary importance in the matter of scope and in consideration of future expansion. The writer of the article points out the factors that enabled The Netherlands State Railways to enlarge its railcar service by close to 100 per cent despite preceding extension of electric traction.

In the review of the achievement to date of The Netherlands State Railways the factor of dealing with the amount of traffic volume overcome discloses clearly up to which size of vehicle the diesel railcar train may be given preference over other means of transport from the point of view of economy. At the same time is given an idea of co-ordination of different means of transport, including road vehicles.

Holland with 250 inhabitants per square kilometer is one of the most densely populated countries in Europe. Thus, conditions for electrification of railroads generally are good, but practice has confirmed again that despite existing relatively high traffic density, a complete electrification of all lines is not suitable, and that a maximum of economy can only be attained through a combination of the two means of transport—electric and diesel trains—each form of railway operation being applied to suit particular needs of particular lines. Moreover, experience has shown that the diesel railcar had to create in some respects preliminary conditions for electrification, thus opening the way to electric railway operation on certain lines.

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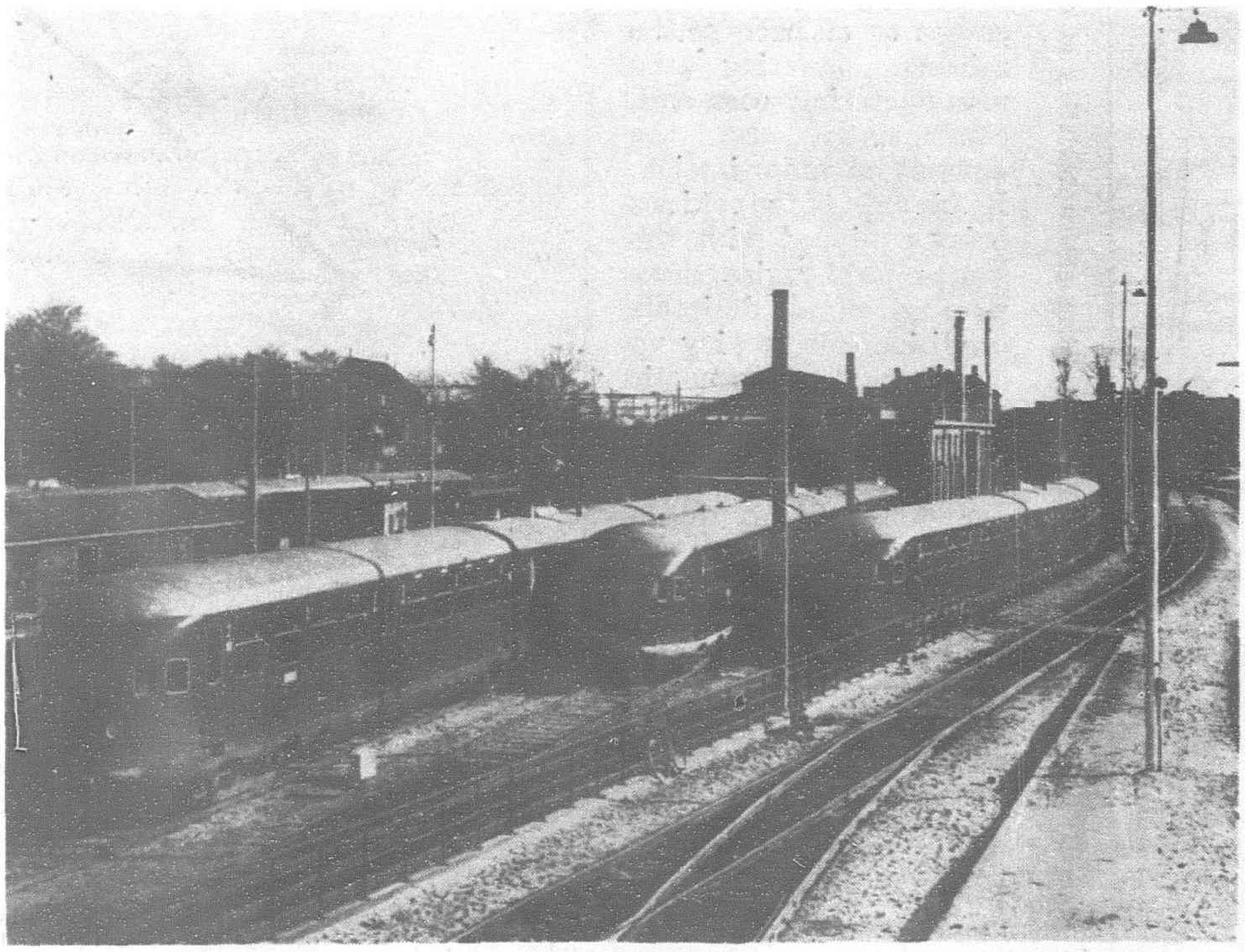
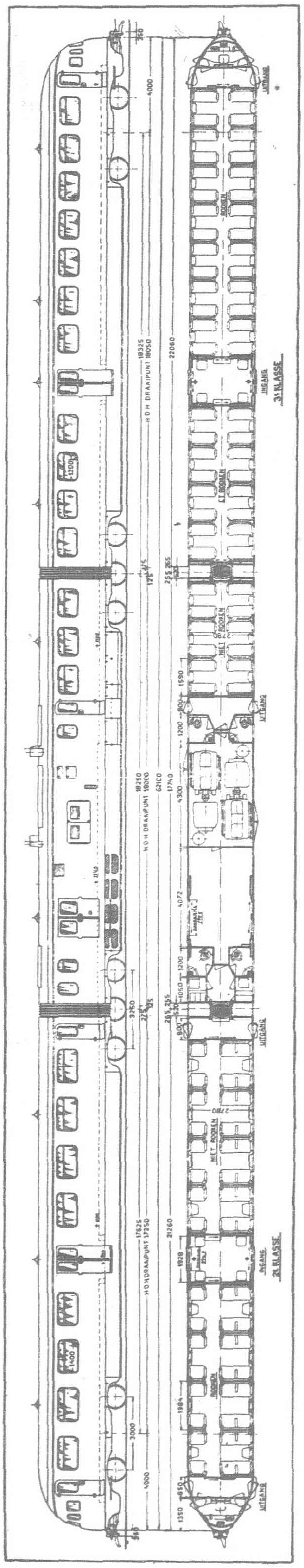


Fig. 2—Showing part of The Haarlem repair shop of The Netherlands State Railways

In 1932 the Netherlands State Railways were confronted with the rigorous necessity to replace a good deal of their locomotive stock. At that time the introduction of electric trains on the so-called central railway net (Amsterdam-Utrecht-Eindhoven; Rotterdam-Utrecht-Arnhem) was understood to be not economical, and this especially because of the high cost of electric current that would have amounted to fls. 0.032 per kw./hour.

It was at the initiative of Mr. Hupkes, former Chief Mechanical Engineer and member of the Board of Directors of the Netherlands State Railways that at the beginning of 1933, the latter decided to order a considerablen umber of diesel trains instead of



Plan showing characteristics of construction of the three-coach diesel trains of the Netherlands State Railways

binding themselves to a future technical development by the acquisition of steam locomotives, being well aware, on the other hand, of a certain risk, because the experiences of that time with this new means of transport were relatively small, compared with those available nowadays. The final course which events took has fully justified this decision of the Netherlands State Railways.

This first extensive diesel program of the Netherlands State Railways comprised, as is known, no less than 40 three-coach diesel-electric railcar trains measuring 62 m (203-ft.) in length, the bulk of which, namely 35 units, incorporated each two high speed 410 h.p. Maybach diesel engines. Figure 1 shows three coupled railcars of this type. Details as to the design of these railcars built in the works of Werkspoor and Beijnes may be seen from the plan.

Thus a comprehensive diesel program was started, at first realized on the so-called central net of the Netherlands State Railways. Thanks to the fact that it was an aggregate order the respective manufacturers could for the first time apply the methods of serial manufacture to this extent to all parts of the railcars, lowering the manufacturing cost and, consequently also the amount of amortization. By far most of the vehicles being equipped with the same type of engine, there were given all desirable conditions for keeping up on adequate and economic repair and maintenance service. With a specific motive power of 8.4 h.p. per ton and a mean starting acceleration of 0.185 m/sec ^{2} (0.41 m.p.-h.p.s.) up to 100 km. (63 miles) the diesel trains could stand up to comparison with the performances obtained in electric service that was only established on the line Amsterdam-Den Haag-Rotterdam with branch lines to Hoek van Holland, Dordrecht and Alkmaar when the diesel trains were set to work. With regard to interior finish of the passenger compartments, favorable arrangement and comfort the vehicles came up to the most exacting requirements.

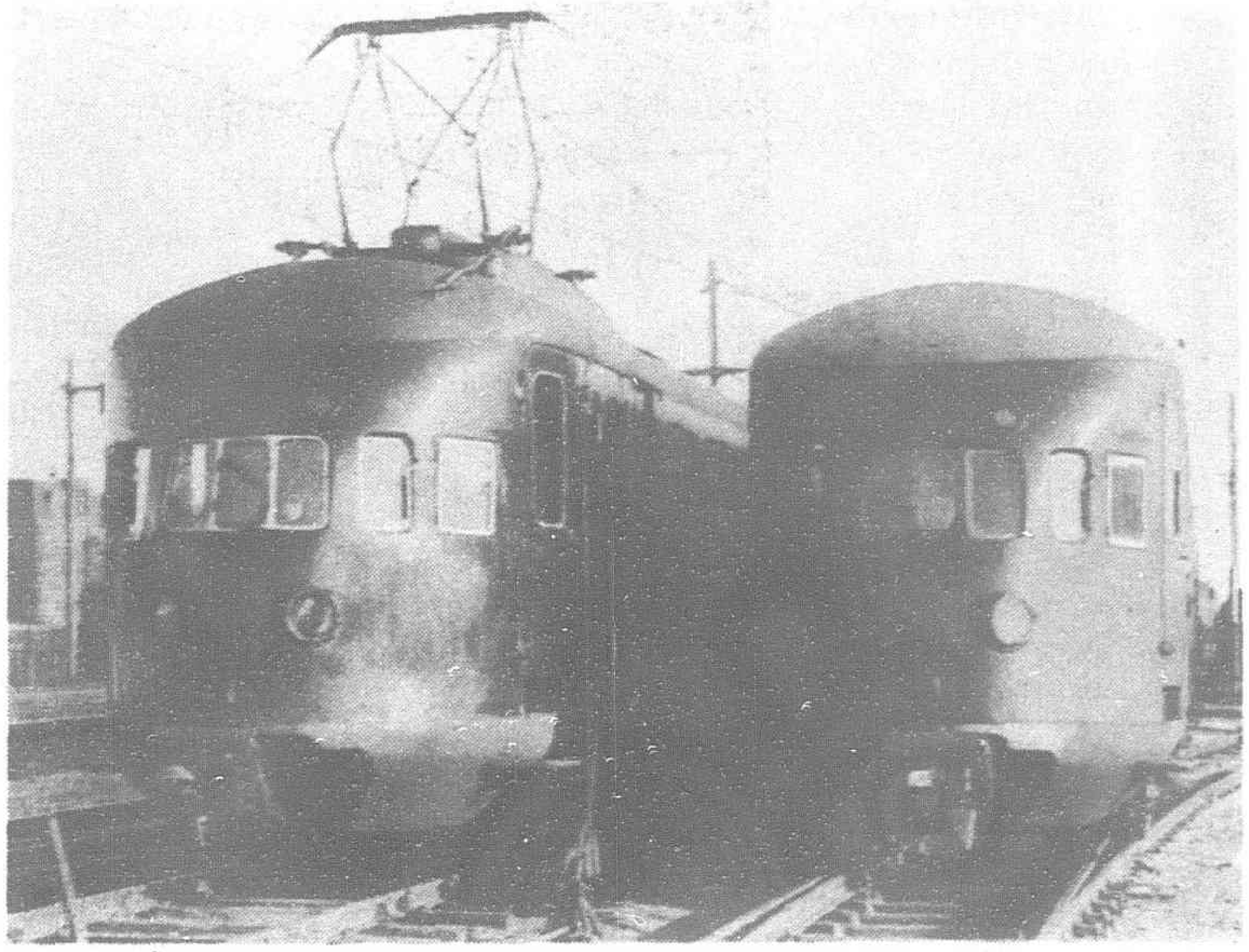


Fig. 4—Three-coach diesel railcar beside a modern electric train. Photo shows distinctly the influence of the diesel railcar on the external shape of electric trains

Therefore it is evident that these vehicles, when placed into service in 1934 and after having overcome the initial difficulties became a very effective means to vitalize the reduced passenger traffic because, apart from a speedy service and the comfort offered to the passengers, the trains had to run frequent services. In this connection, for the first time, a schedule of the so-called "main station system" was introduced, whose principle consists in

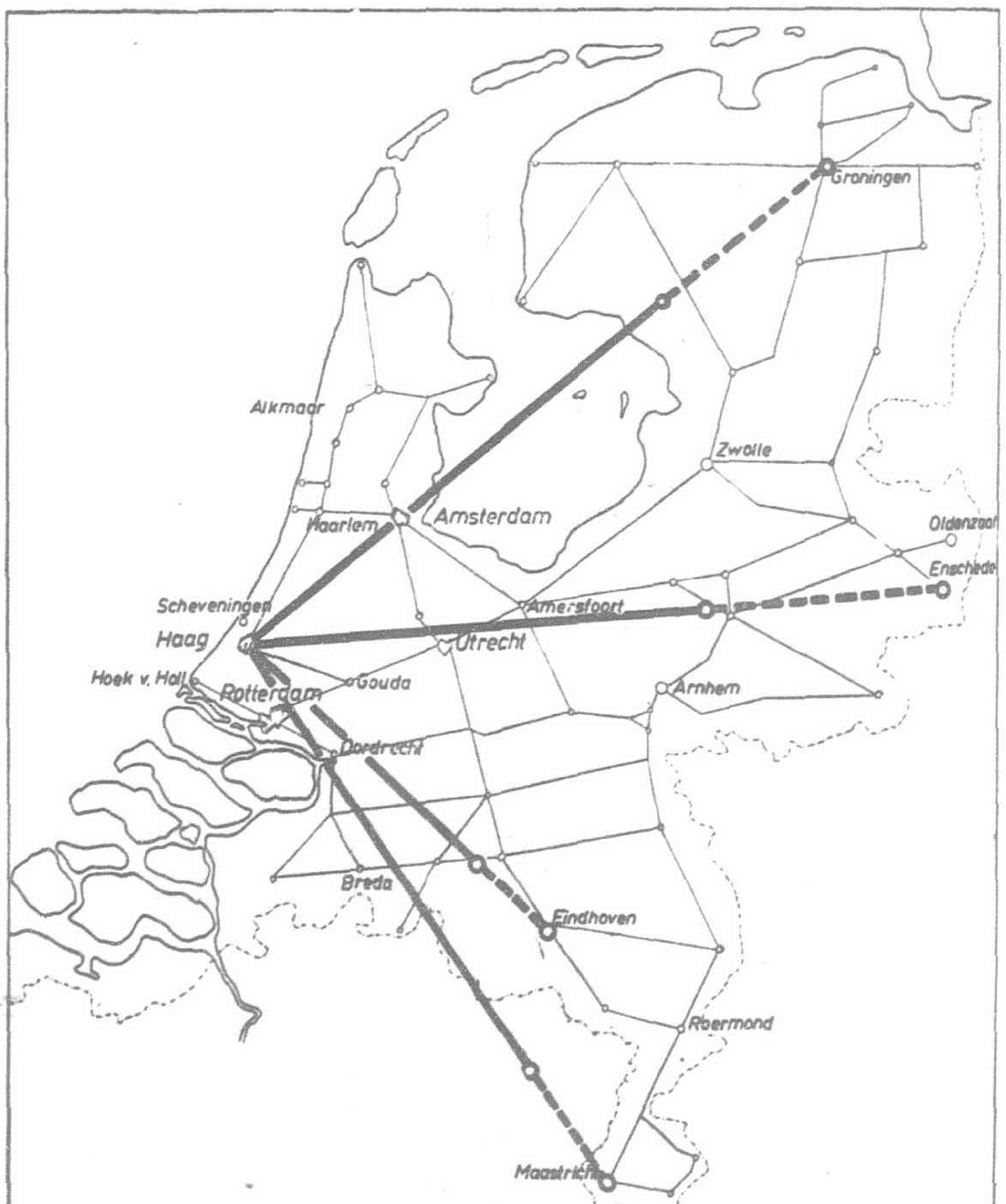


Diagram illustrates dimunition of the travelling time comparing the actual and the former travelling times between the capitals of the country and the more distant towns

creating rapid junctions at regular succession among the trains at the main centers of the railway net.

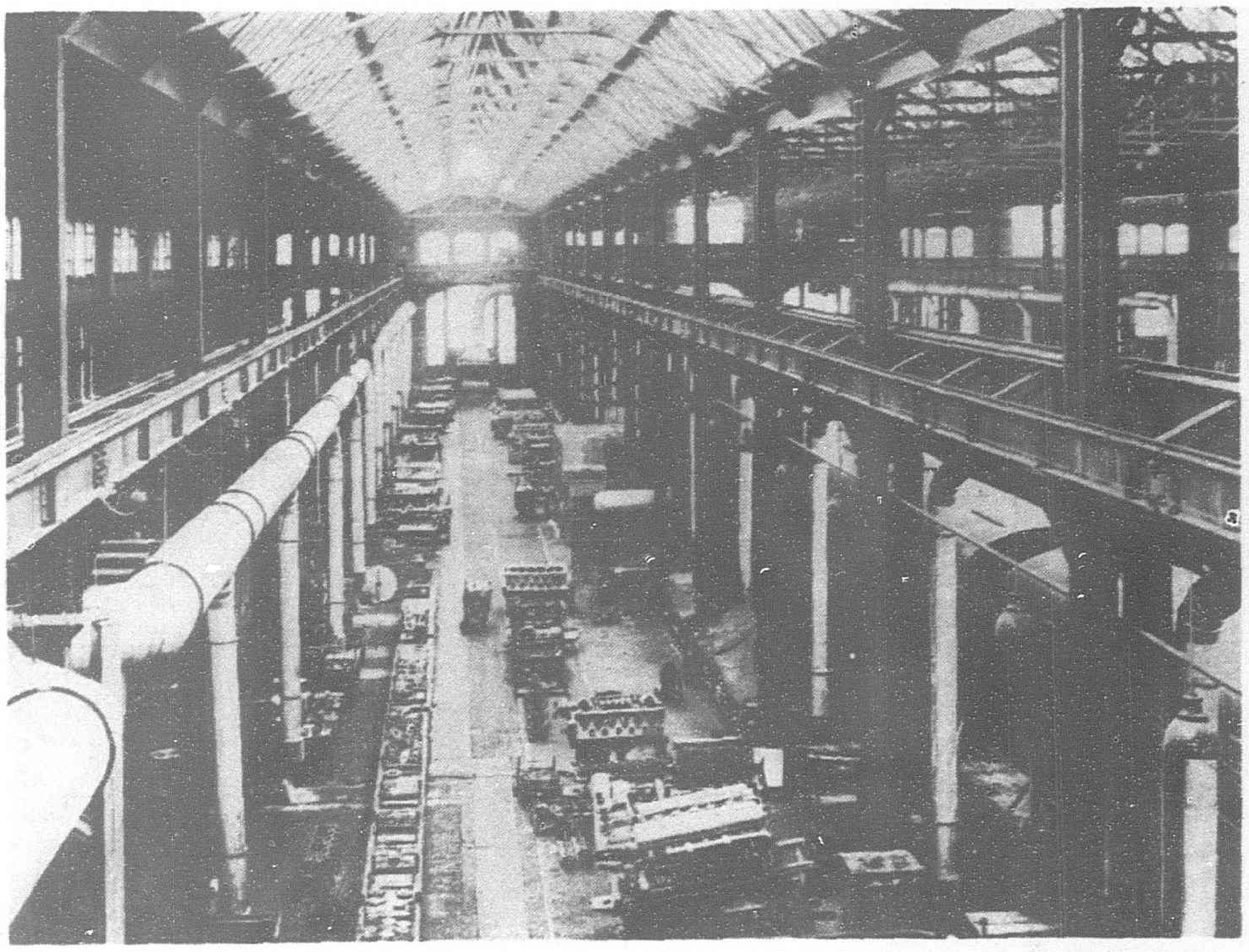


Fig. 3—Mounting hall of the Haarlem repair shop of The Netherlands State Railways

The three-coach railcar trains of the Netherlands State Railways have now been in service for five years. At the beginning they were mainly serving the so-called central net, namely the lines Amsterdam-Utrecht-Eindhoven; Rotterdam-Utrecht-Arnhem. Later on when the central net was electrified, these trains were used on longer lines with less traffic. The three-coach railcars were designed from the beginning for operation of two and more coupled trains from one driver's stand. This has then been carried through successfully with most of the railcar trains.

Service and Maintenance

Provision has been made at the central Utrecht depot for all necessary equipment, not only concerning the current upkeep work such as tanks, pits a.s.o., but also for careful training of the local staff, particularly by the suppliers' experienced specialists. Figure 2 shows part of the depot.

Owing to the great number of identical vehicles, all equipped with the same type of engine plant, and due to the fact that the experiences gained in regular service were concentrated upon one place, this maintenance work could be executed in the course of time in a most economical and perfect manner. Nevertheless, the capital investments for equipment were moderate because the railcars had been designed with a view to make operation independent of any expensive equipment. Thus, the construction of the cars and the connection of the heating plant with the cooling installation permit leaving the vehicle in the open air when not required for service and during night, even in cold weather. Consequently no special sheds are required for housing the cars.

At the Utrecht depot all current upkeep work relating to the engines is carried through, except the main overhauls. For the main and intermediate overhauls there has been provided the

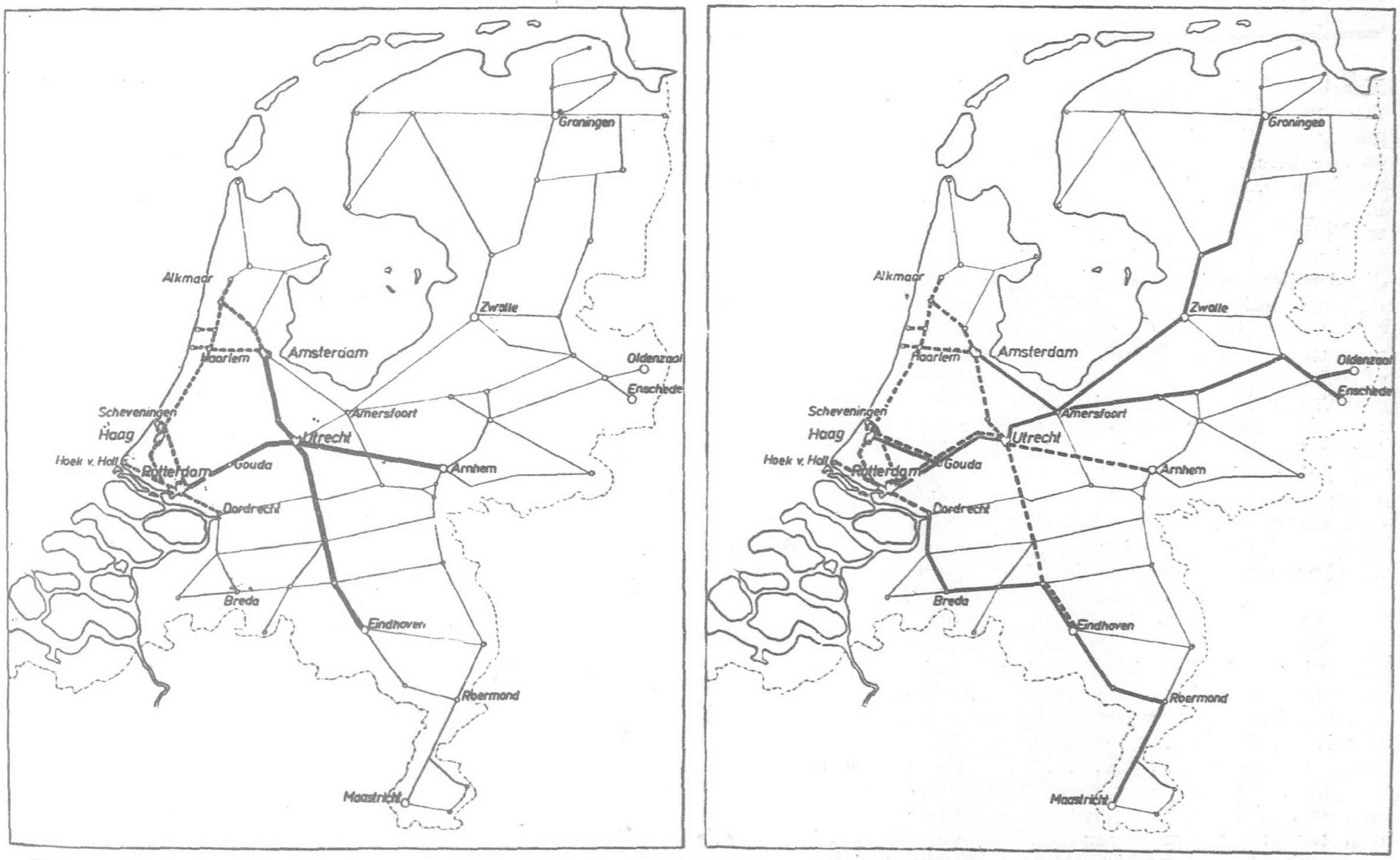
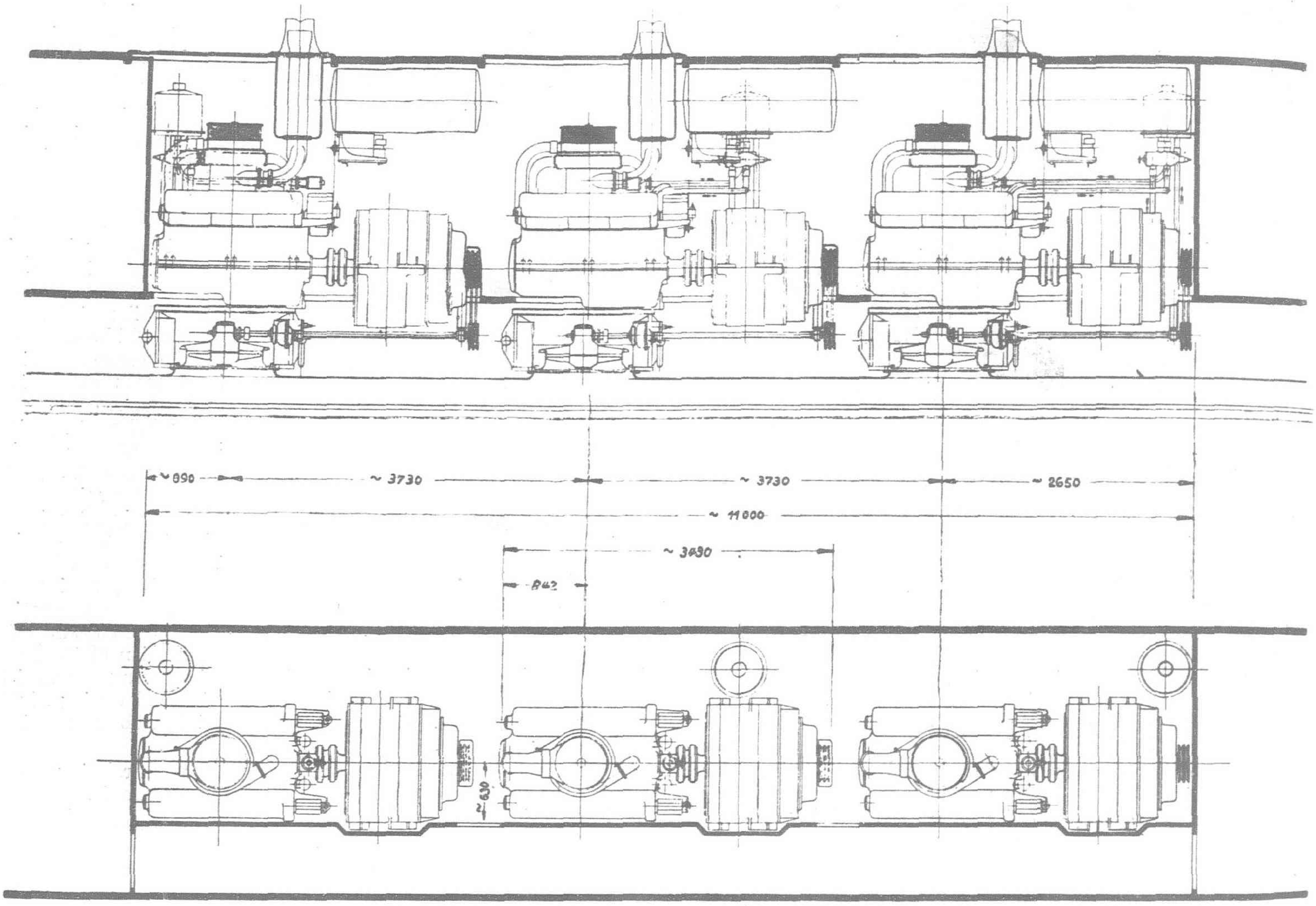


Diagram to left shows first diesel program of The Netherlands State Railways (1934) and to right the mixed traffic on these railways

Heay black line denotes .. .. Diesel railcars
Broken line denotes .. .. Electric traction
Light black line denotes .. .. Steam trains



Haarlem repair shop. With the same aim to face, namely to concentrate the experiences gathered with this new means of transport at one place, part of the existing Haarlem repair shop, that is to say, two of its eight halls, each of which measures 8 m (26-ft.) in width and 100 m (328-ft.) in length, were particularly fitted to suit the requirements of diesel railcar main overhauls. Owing to the uniform design of the engine sets to be overhauled, it was possible to base the necessary overhaul equipment on the principles of serial work.

The engines withdrawn from the railcars are taken into the adjacent mounting hall (figure 3) where there is special apparatus permitting quick dismantling of the engines. From there the component parts are carried on a conveyor running in the longside direction of the hall, into the washing tanks. The parts are already orderly arranged in suitable boxes and need not be taken out for washing. Then the conveyor carries them to a control department equipped with the necessary measuring devices and incorporating a special room for the testing of certain parts by the so-called limed milk proceeding. The purpose of this examination is to ascertain if, and to what extent overhaul work and spare parts are necessary. The latter are procured from the adjacent store and conveyed with the other components to the mounting hall. For eventual repair of certain parts suitable tool machinery is provided in the adjacent hall so that they need not be transported over long distances.

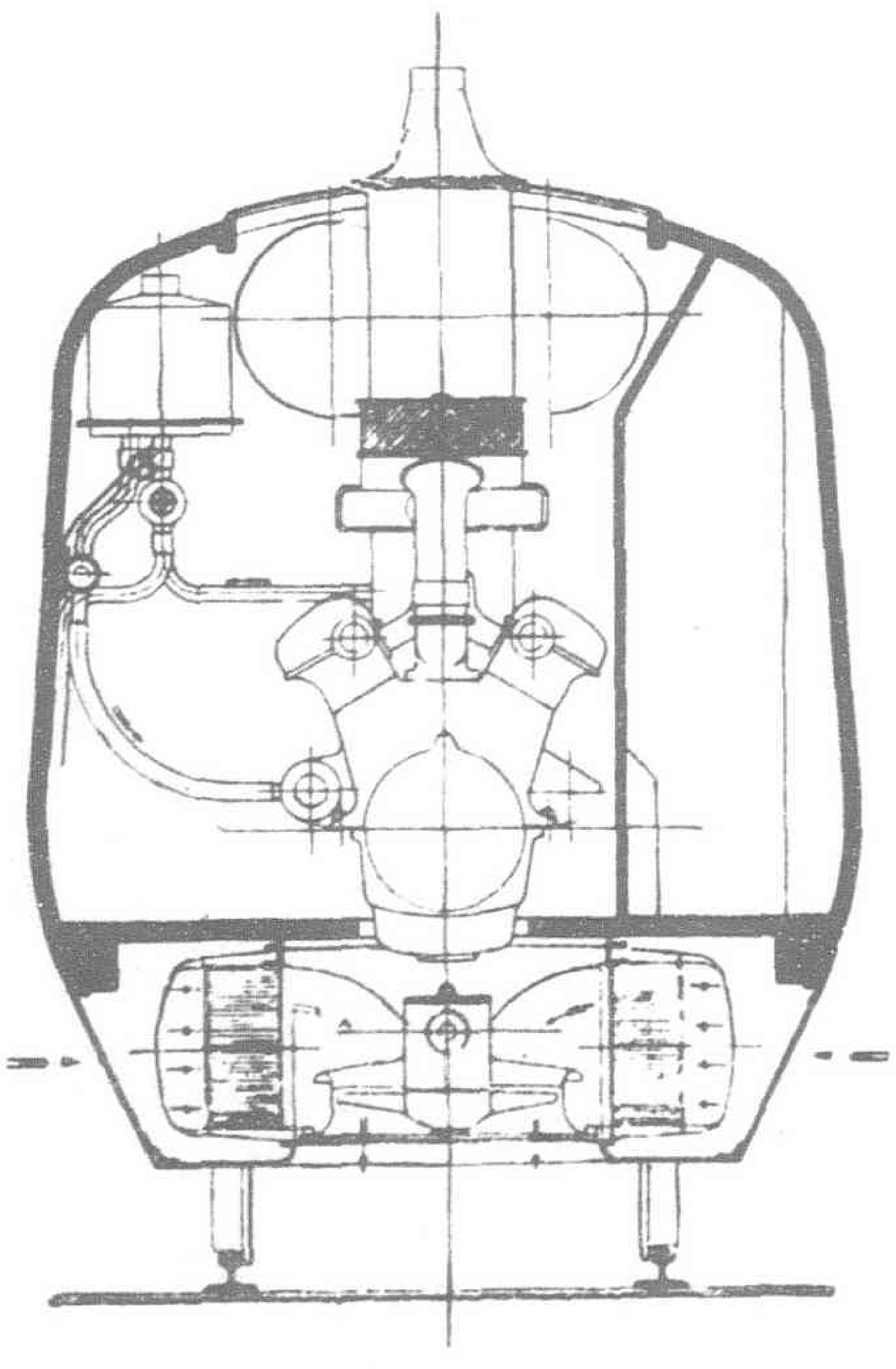
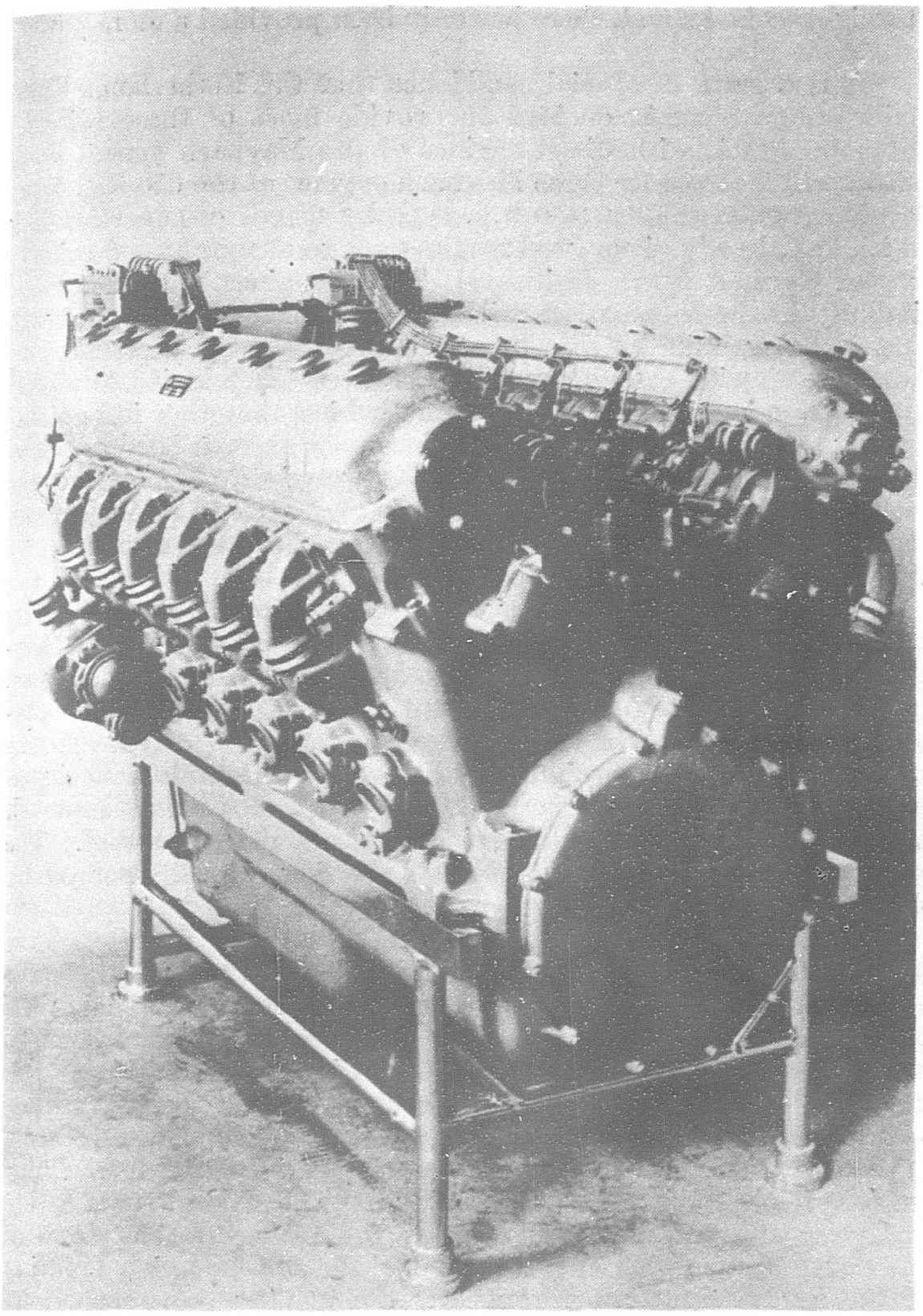


Diagram shows arrangement of the three 650 h.p. diesel power sets in the engine room of the five-coach diesel-electric railcar trains of The Netherlands State Railways

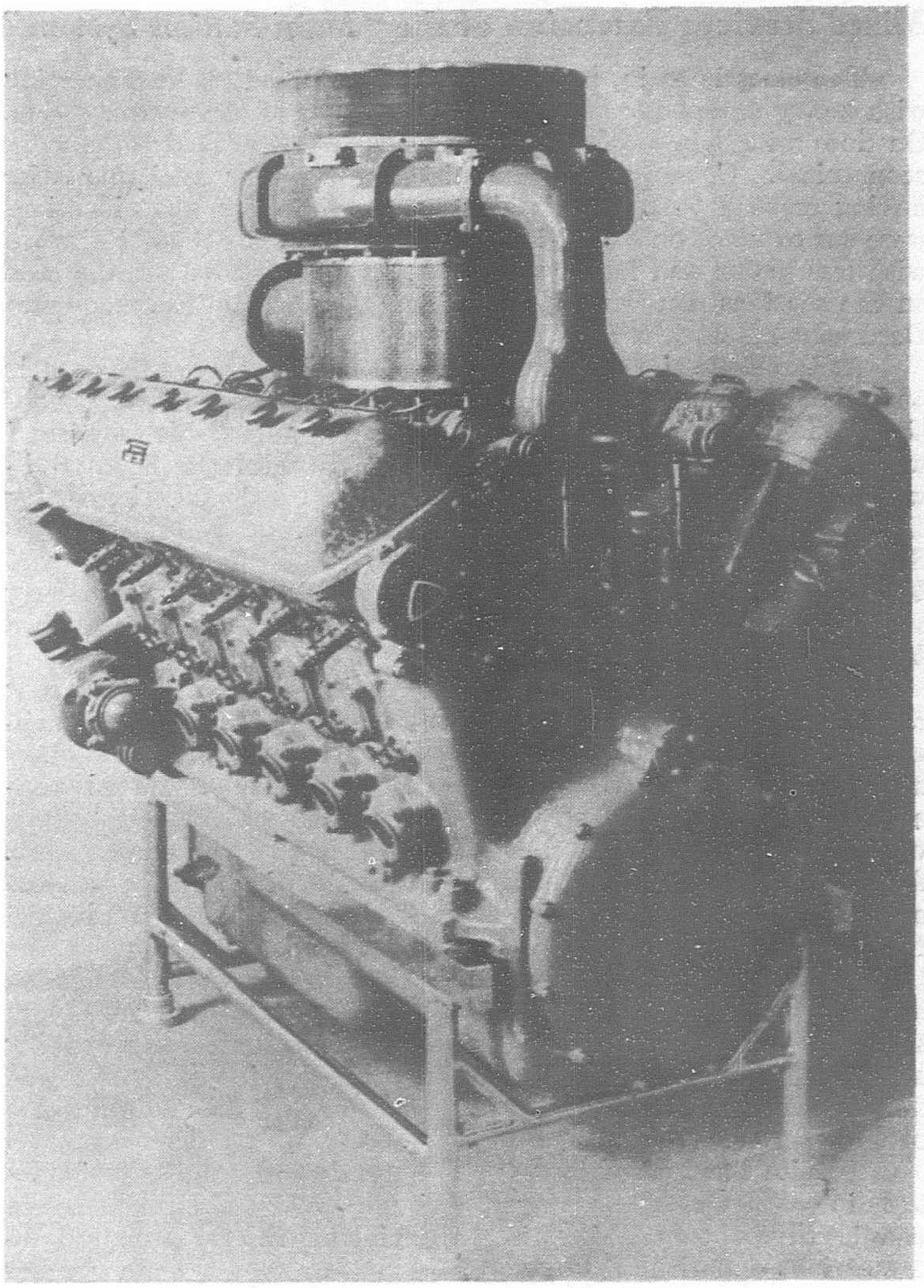
Before the re-assembling of the engine the various component groups (water pump, oil pump, fuel pump a.s.o.) are overhauled and assembled, adequate testing equipment being arranged beside the working place. When finished, the engine is tested on one of the stands provided for this in a bright and spacious room outside the mounting hall fitted with all necessary measuring instruments and including all desirable facilities for the operating staff.

Experience has taught that it is necessary to examine in the course of the test run the adjustment of the electrical transmission, and if necessary, to correct it. Since with regard to the schedule this is not always possible there has been provided a special electrical test stand permitting the built-in engine to work during standstill of the car at a desired load and as long as required for the final adjustment of the equipment, so that a short trial trip will be sufficient. It is fully evident that this new device involves a considerable saving in time and expense. Thus the well-planned establishment of this repair shop and the concentration of a great number of equal engines have resulted in considerable advantages as one can make full use of all possibilities with regard to material and staff.

The period after which Maybach engines are overhauled is an average mileage of 120,000 km. (75,000 miles). This figure does not represent at all the upper limit, quite a number of engines having been retained in service for a notably longer period (140-150,000 km.=88-95,000 miles) for certain reasons relating to service. It may be briefly mentioned that these engines covered in 1938 a distance of ten million kilometers (6.2 million miles) approximately, i.e. a monthly average mileage of over 10,000 kilometers (6,200 miles) per engine.



12-cylinder Maybach diesel engine, 410 h.p., as installed in the three-coach trains of The Netherlands State Railways



12-cylinder Maybach diesel engine, 650 h.p., as installed in the new five-coach diesel train

Electrification of the Central Net (1938)

As already mentioned, the operation of diesel railcars on the central net of the Netherlands State Railways involved a vitalization of traffic. Owing to the increased traffic, the problem of electrification of the central net of the Netherlands State Railways arose again, but there was still another consideration.

Experience with the diesel trains taught that light metal structure and stream-lining, when applied to an electric railcar with overhead line, would result in a considerable saving in energy. Consequently, there were introduced on the section Rotterdam-Hoek van Holland a number of streamlined electric trains by way of trial. Their constructional details were backed by the experience gathered with the diesel railcar trains. It has appeared that—applied to square meter of floor surface—the current consumption of these streamlined electric trains was 40 per cent less than that of the trains of former type. The Netherlands State Railways had long negotiations with the different electricity supply companies with the result that they succeeded in obtaining electric current at fls. 0.015 per kw./hour. This important saving in current cost and consumption (40 per cent) induced the Netherlands State Railways to enlarge their electrical net. The Dutch coach builders therefore received orders for a great number of such modern streamlined electric railcars in light metal structure which were to replace in 1938, when the electrical track equipment had been achieved, the diesel trains on the forementioned central net. Figure 4 reveals in an undoubted manner that the diesel railcar trains have influenced the external features of the electric trains.

Showing interior of the third-class passengers' compartments of a three-coach diesel train of The Netherlands State Railways

Mixed Service; Extension of the "Main Station System"

The electric train, however, is only justified on lines meeting with heavy traffic due to the high initial cost of the overhead line. On lines with less traffic the diesel railcar has proved to be more economical. Consequently the diesel trains now available after having created to a certain degree the base for electrification, were set to work on other lines of the Netherlands State Railways with less traffic and longer distances. This is, above all, the case on the sections Amsterdam-Groningen ; Amsterdam-Enschede and Dordrecht-Maastricht (Compare figures 5 and 6).

At the same time when the number of lines served by electric and diesel trains was increased, and when the new service regulation came into force on May 15, 1938, the "main station system" was introduced for the entire net of the Netherlands State Railways. This system had been applied, as already mentioned, for the first time in 1934 and had given good results. The Netherlands State Railways now maintain practically on all lines a *regular two hours service* which is being intensified on lines with particularly strong traffic to a *regular service at intervals of an hour or half an hour* during all the day or part of it.

With a view to increase the travelling speed when the new regulation of service was introduced, the Netherlands State Railways dropped quite a number of ordinary trains and on the other hand, raised the number of express through trains. In this connection altogether 148 stations were eliminated, which, by the way, were of little value, thus doing away with 1,800 stops a day. At the same time the maximum speed of the diesel trains and the new electric railcars was increased to 120 km./hour. While the Netherlands State Railways, on the one hand, abandoned the *light traffic* to the road (the last issue of the official schedule included also the tramway, ship and bus connections), they regained, on the other hand, the *heavy traffic* thanks to an increased travelling speed and, above all, to a more frequent service of the express trains, taking thus an important step towards the co-ordination of transport means.

To cite but one example : The number of express trains on the line Amsterdam-Groningen was increased from seven to 11 couples (five of them being diesel electric) and the line Amsterdam-Maastricht experienced an increase from six to ten train couples (five being also diesel electric). As a result of the introduction of diesel trains the travelling time on these lines was reduced from three hours 25 minutes to two hours 25 minutes and from three hours 43 minutes to two hours 57 minutes respectively. In figure 7 the diminution of travelling time, the present and the former travelling times between the main stations of the country and the more distant towns being compared to each other are illustrated. It will be understood that such a vigorous action should not have remained without success.

Indeed, soon after the introduction of the new schedule a sensible flow-back of passengers to the railway could be observed and it is interesting to note that traffic did not only improve at the expense of the existing bus enterprises, but that even private car owners preferred now in many cases to use the railway. The general acceleration of traffic imposed, of course, higher stresses to the rolling stock. On the other hand there was a necessity to increase reliability in service, the trains lacking practically every possibility to have delays, owing to the concentration of the trains at all important and communicating central stations of the country. The results obtained in the meantime show that the diesel trains essentially affected by this new traffic regulation met in every respect the more severe requirements. The average mileage of the engines between the main overhauls could even be raised.

Second Extensive Diesel Program, 1940

Since the Netherlands State Railways carried through in an effective manner the plan made with a view to eliminate, wherever possible, the uneconomical steam service, and the number of lines where electrification could not be recommended being still great, it was decided in 1938 to enlarge considerably the stock of diesel trains. The realization of this decision was started in summer 1938 when the Netherlands State Railways placed again an aggregate order for no less than 20 five-coach diesel electric railcar trains. Regarding arrangement and interior finish as well as external features, these *five-coach* trains will be adapted to a great extent to the existing stock. Considering the addition in weight to be hauled, there has only been provided a more powerful engine plant.

It is a mark of special confidence that the Netherlands State Railways have again decided to provide most of these railcars, 18 to be exact, with diesel engines of the Maybach type. Each railcar will incorporate three Maybach engines of the 650 h.p. type, developed from the 410/450 h.p. type by means of supercharging which has already given good results on a great number of railcars of the German State Railways. These engines will be placed similarly to the three-coach railcars in a special engine car (fig. 8) that is being built by our Dutch licensee, Messrs. Werkspoor of Amsterdam, with the difference to the three-coach trains, however, that the engines will be arranged one behind the other in one row leaving a lateral passage. The engine room as such is so spacious that it permits the location of all auxiliary devices. Each generator set has its own cooler group of the Maybach type, suspended from the underframe underneath the diesel engine and mechanically driven off the engine flange by means of a V-belt.

As for the rest, the arrangement of the new five-coach diesel trains of the Netherlands State Railways is provided in the following manner : The first car will seat the second class passengers. It is followed by the engine car containing also the luggage compartment and by three third class cars. At each end a driver's stand is fitted. The equipment of the driver's stands is designed in such a manner that it permits the control of several five-coach as well as three-coach railcar trains from one driver's stand. The railcars are also intended for use on the lines actually served by the three-coach trains.

There is no doubt that the Netherlands State Railways have found by their mixed service-electric and diesel trains—the most economical and suitable solution of the problem of replacing the uneconomical steam trains. Since both means of transport are uniform with regard to exterior features, interior arrangement and finish of the passenger compartments, and as the advantages offered to travellers as far as speed and comfort are concerned, are the same in both cases, the public sees practically no difference. Both enjoy utmost popularity permitting to the Netherlands State Railways an optimistic lookout for the future development of passenger traffic. Moreover, this logical and effective solution of the urgent problem of transport remodelling was reached by the Netherlands State Railways within a relatively short time. Whereas, some years ago, the steam locomotive still determined the face of Holland's railway traffic, it is now the streamlined train, either with diesel or with electric drive, that has inaugurated, to a certain degree, a new railway age.

Price Control in Japan

(Continued from page 219)

relations are to be adjusted and the proper regulation of salaries is to be made.

Freight Charges.—These will be fixed officially and the volume of unneeded goods, by curbing shipment of speculative goods, by controlling excess complication, by locating factories nearer to railways and by unifying control over land and water transportation.

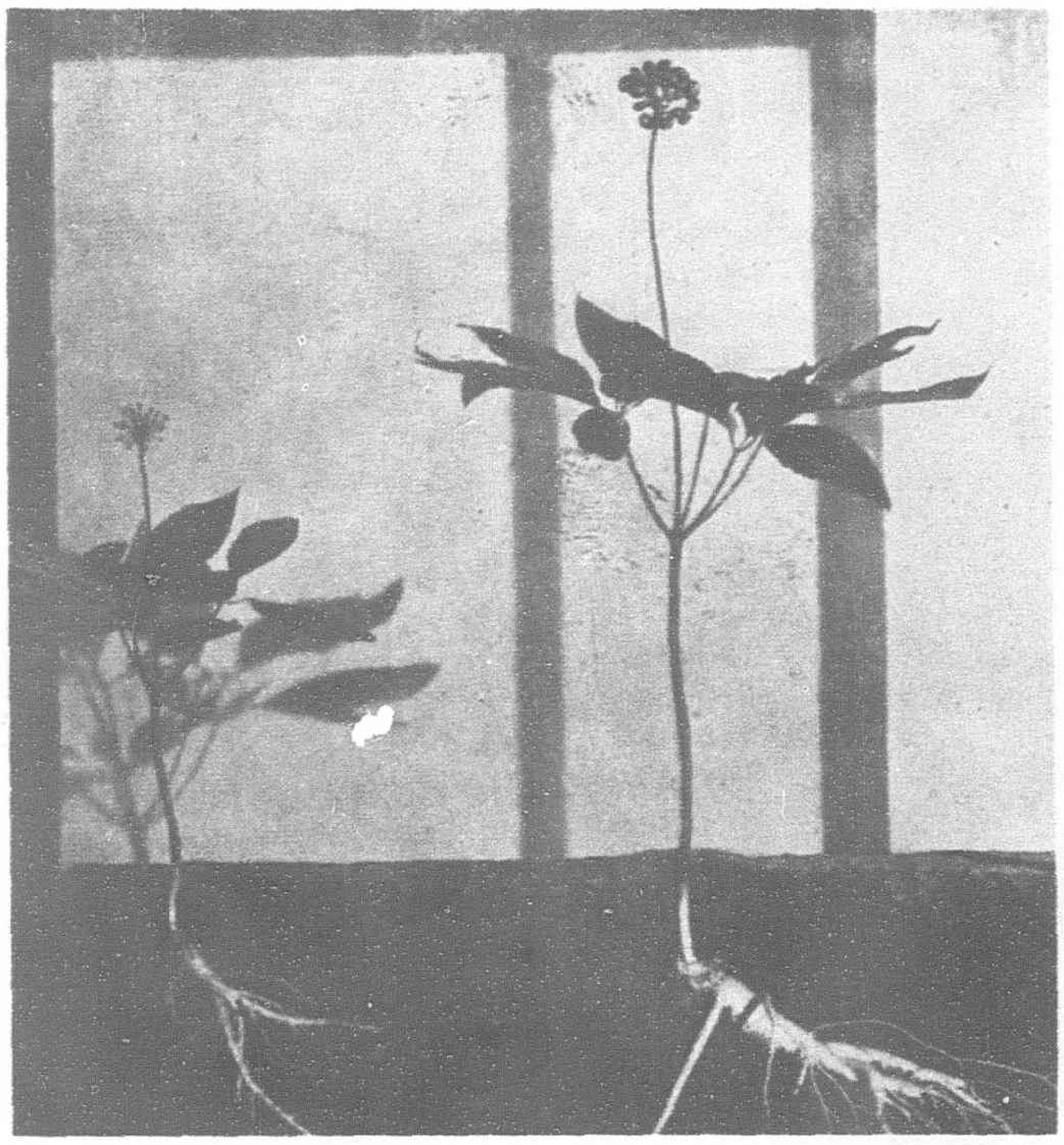
Profits.—Generally, profits are to be reduced because of their influence on prices. Fixed profits will be allowed manufacturers and distributors when official prices are fixed. However, "rational consideration will be given to wartime risks and depreciation."

Enforcement Strict

Public announcements state that many organizations are to co-operate in making regulations known and to attempt to make them popular with individuals. Existing penalty regulations are to continue and from time to time will be made more severe. At present, price control machinery, inspection bureaux, etc., are being established. The economic police have already begun to make their visits. The present regulations, about to be enforced, have nothing to do with published or actual selling prices but are based upon manufacturing costs which are extremely difficult to conceal.—W.H.C., Jr.

Husbandry and Industry in Korea

KOREA is essentially an agricultural country, eighty per cent of the entire population being engaged in agricultural pursuits of one kind or another. A mountainous country, like Japan, with few large plains, there is yet enough arable land not only to feed the people but also to permit of the export of much of its produce. Moreover, the soil, though not very fertile, is still fertile enough to support a thriving economic community if properly attended to; hence the vital importance of agricultural improvement to the welfare of Korean life. Yet the great majority of the people, keeping to their old method of husbandry, paid little or no attention to this point, and it was only after the protectorate regime was established that the need for it received any serious consideration. Since then, and more especially since annexation, the utmost efforts have been put forth by the Government for the modernization of the Korean agricultural system. As the country is mountainous and has to support a large and growing population, though one not half so dense as that of Japan, it naturally follows that "intensive" method should be pursued through the application of scientific methods.



Mature Ginseng Roots

Keeping this in view the authorities set to work toward agricultural transformation of the country, and one of the initial measures was the establishment of Model Farms. During many years, at these institutions, most of which are situated in the outskirts of country towns, experts have been conducting scientific experiments in farming, sericulture, horticulture, and stock-farming, and the results of their work are made the basis of the Government policy as far as technique is concerned, whilst individual farmers and planters look to these experts for guidance.

The Government Agricultural *Experimental Station at Suigen* was founded as the principal center in 1906 by the Residency-General, and it has branches in several of the provinces. The Farm occupies an ideal site for an institution of such a nature and an extensive tract of land was appropriated to its use. It has been engaged from the outset in all lines of experiment and investigation of agricultural interest, and has contributed a great deal toward the promotion of agricultural development.

Various local organizations formerly existed in the country, having as their object monetary accommodation and co-operative undertaking of agricultural enterprises. These numbered over 500 with more than three million members, but as a whole they lacked unity and solidity and were often the source of scandal. To bring them under uniform and efficient management and thereby conduce to the general development of agricultural industry, regulations framed on those in force in the homeland were issued and enforced in March, 1926. They provided for the formation of *Agricultural Associations* in all towns and districts, and at the same time all kindred organizations (except those for live-stock) were ordered to merge themselves into the newly-formed associations.

The Fire Fields

According to the latest returns, the total *area of arable land* is five million tyobu, of which about one-third is taken up by paddy fields and the rest by dry fields. In addition the area under cultivation in the mountainous districts known as "fire fields" is 410,000 tyobu. These represent about 20 per cent of the entire area of the country, and average 1.6 chobu per family. In the southern half of the country the area of paddy fields equals that of dry fields, while in the northern half the proportion is one to five.

At present there are about forty thousand families of two hundred thousand persons working in the cultivation of *fire fields* in the mountainous districts. These poor people are driven by hunger from place to place, making shelters in log cabins and keeping their bodies and souls together by planting grains and vegetables on the hillsides. Their methods are to set fire to State forests in order to open up fields before sowing seed. Thus they often expose good forests to the danger of mountain fires and devastate fertile lands. In the urgent need of maintaining a livelihood for these poor workers as well as of protecting the State forests, the Government-General adopted the plan of allowing, in principle, the "fire-field tillers" to remain and continue their cultivation of the fields already occupied, but forbidding such as are deemed harmful to the preservation of State land and to forest administration.

Other forestlands, suitable for agriculture, are leased gratis with the provision that, when these are made into good fields and the farmers have decided to settle there, the Government will transfer these farmlands to them without cost. To carry out this plan the Government-General now maintains forty-five stations for mountain agriculture guidance and five supervising offices with a large staff of experts. These experts are stationed among the fire-field villages to guide and teach the farmers new methods of tilling, to give them vocational training, to provide them with low interest loans for agricultural funds, to help them buy necessities and sell their produce, to encourage savings and moral culture, to regulate the supply and demand of charcoal and other fuels, and to plant trees to increase the scenic beauty. In short no effort is spared to establish ideal and flourishing villages among the mountains.

According to the latest investigation there are about 300,000 tyobu of *uncultivated land* suitable for agriculture. Of these 100,000 tyobu are set apart for the settlement of "fire-field tillers," and the remaining 200,000 tyobu can be leased at regular rent by captains of industry in accordance with the law for developing State uncultivated lands and with the forest law on condition that subject to successful improvement the lands will be transferred without cost.

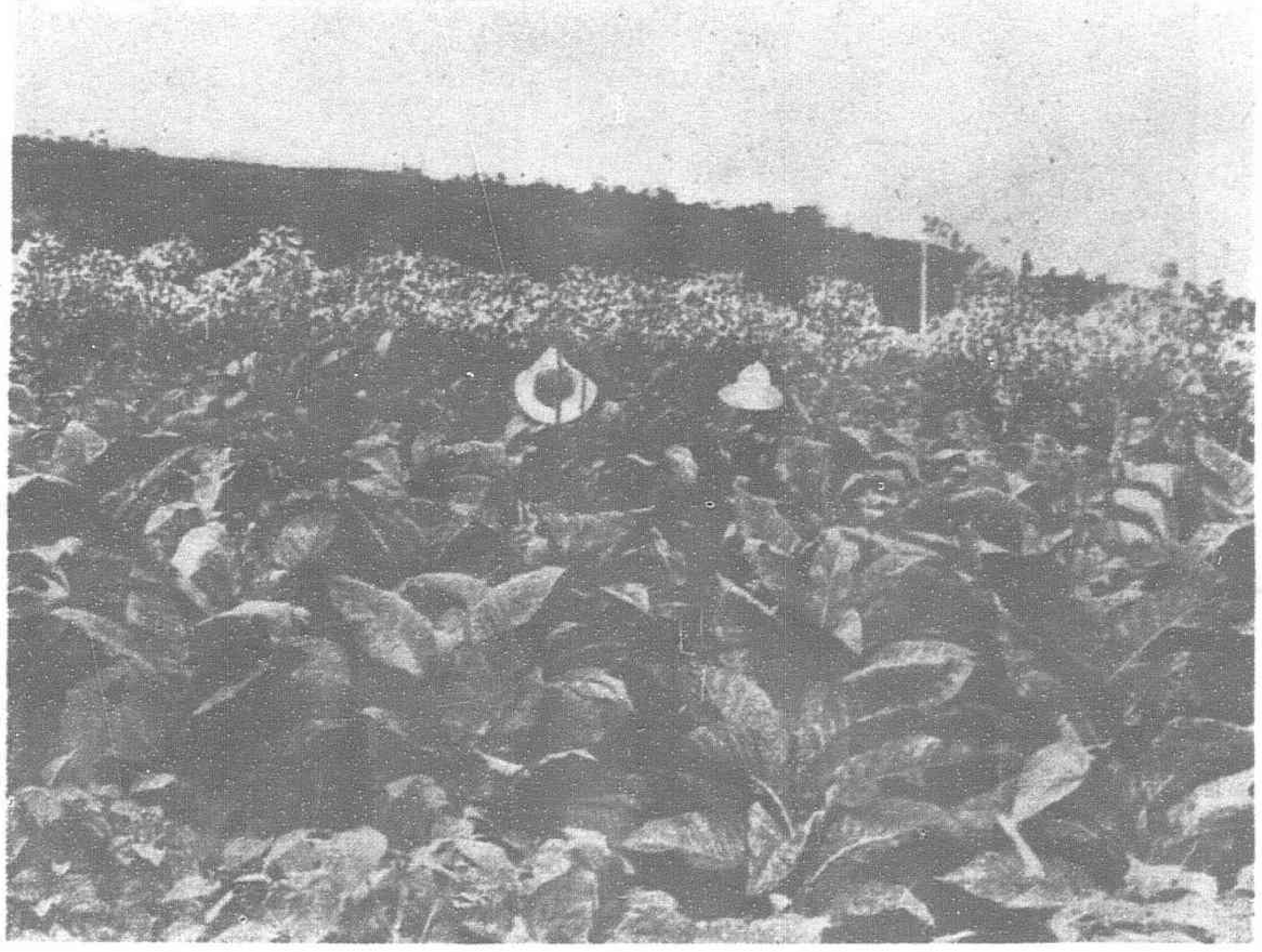
Irrigation Systems

Until recently Korea had scarcely any *system of irrigation*. In her more flourishing days there existed irrigating ponds and dams in large numbers, but so consistently were they neglected during her era of maladministration that most of them disappeared or turned into deserted swamps. Since the entry of the Japanese into the country, irrigation systems on an extensive scale have been initiated in various localities, and with the extension of reclamation works much land hitherto lying idle has been brought under cultivation. Thus, up to the present, about 68 per cent of the total area of paddy fields has been provided with irrigation. The remaining 40 per cent depends entirely upon the rainfall, and even in a successful year produces only half the yield obtainable from well-conditioned land. The encouragement of irrigation works is therefore being vigorously pursued.

In July, 1917, new regulations relating to *irrigation associations* were promulgated for the better irrigation, drainage, reclamation of waste land, etc. As many of them, however, found it difficult to do without financial aid, special regulations were issued in 1919 for subsidizing their works. Later under the revised regulations issued in 1920, the subsidies for land-improving enterprises were augmented, the amount ranging from 20 to 30 per cent of the cost according to the kind of work to be done, and at the close of the fiscal year 1936 the number of associations actually in working order was 190 operating over an area of 216,448 tyobu, while five others were actively engaged in construction works designed to serve an area of over 2,653 tyobu, the total expenditure on all these enterprises at the end of the same year amounting to over Y138,790,000. There still remain many tracts of land marked out for improvement.

Since the work of the irrigation associations have so obviously assisted the development of agriculture, the Government has always encouraged their formation, but owing to the impossibility of their being in a position to serve the whole of the arable land in the immediate future it has permitted the existence of private undertakings. Since these works affect people in various economic ways, it is provided that official permission must be obtained before starting work. Owing to the rapid increase in population in Japan the supply of food is in danger of failing to meet the demand, and so the authorities have been tireless in encouraging increased production of rice, and the total volume of Korean rice exported is now over ten times that exported in 1910, the first year of the present regime. This increase is largely due to improvement in the varieties grown and in the method of cultivation and fertilization. The consumption of commercial fertilizer in 1936 amounted to Y73,683,000.

With advance in the production of rice, *official inspection* of rice destined for export became necessary, so that transactions in it might be creditably conducted, and in 1915 regulations for the purpose were promulgated, but these were revised in 1917 and again in 1921, by virtue of which the standard of the inspection system was raised and exportation of rice of inferior quality prohibited. Regulations relating to soya-beans were also enforced in the same manner. In October, 1934, regulations for the official inspection of Unhulled Rice was promulgated and enforced. In this way the quality of rice and beans produced has been markedly improved, and they now enjoy high credit in the Japanese market.



Korean Tobacco Plants at Maturity

Korean farmers are still obliged to sell their produce during harvest time on account of poverty and the lack of warehouses. Large quantities of Korean rice are exported to Japan Proper in a rush for the period of four or five months after harvest. This has caused great difficulties to the Japanese farmers and rice merchants, and the price of rice falls heavily, with great loss to the Korean farmers themselves. The Government-General established *agricultural warehouses* to aid the producers to hold their crops at harvest time, and encourage them to wait for more favorable prices, and to stabilize the exportation of rice. In 1930 the warehouse plan was enlarged, and in addition to the agricultural warehouses in places of production, export warehouses were established at the ports. It is hoped that these warehouses will be instrumental in safeguarding the interests of the rice producers, and in regulating the export.

In its efforts to put agriculture on a sounder scientific basis the government, both central and local, has used every endeavor to employ trained experts, and to place them throughout the country. At present there are 2,570 agricultural experts.

Agricultural Production

Agriculture has of late developed so appreciably that the total value of the crops in 1936 amounted to Y1,208,910,000, of which Y308,040,000 was exported, mostly to Japan, forming 52 per cent of the total value of the export trade, and these items, when compared with 1910, the year of annexation, show an advance five and half times as great as the former and twenty-four times the latter. As in most other countries, by far the largest part of the arable land is devoted to the growing of grain and pulse, of which the principal are rice, barley, wheat, soya-bean and millet. In 1936 there were three million families engaged in farming, that is 73 per cent of the total families.

Rice is the most important of all agricultural products. Its annual production, after having provided for all domestic needs, furnishes the largest and an ever-growing item in the export trade. In 1910 the area of rice-fields amounted to 1,350,000 chobu yielding a crop of 10,400,000 koku, rising in 1936 to 1,601,000 tyobu and yielding 19,410,000 koku, its export during the same period making even greater increase from 544,000 koku to 8,472,000 koku. Such progress was made possible by the improvement introduced in the method of cultivation, in the selection of seeds and manure, and in irrigation and reclamation.

Barley and wheat are chiefly cultivated for home consumption. They are all autumn grown, and in the southern provinces, where irrigation works are common, are often sowed in the paddy fields after the rice is harvested. As the result of encouragement of their cultivation, coupled with improvement in the use of commercial fertilizers and prevention harm by noxious insects, the area thus made to yield two staple crops a year was considerably increased. In 1936 the production of barley and wheat was 10,400,000 koku.

Soya-beans rank next to rice in importance as an article of export. Though, owing to reckless methods of preparation, such as drying and assorting, the bean was at one time unable to gain any extensive outside market, it is now in high esteem in the Japanese market through the adoption of measures for thorough improvement in quality. The destination of its export is mostly Japan, as in the case of rice, where it is used not only for food but also for chemical industrial purposes, and the amount exported is yearly on the increase. In 1936 the area under cultivation was 790,000 tyobu producing 3,780,000 koku of which 1,250,000 koku valued at Y23,470,000 was exported.

Red beans, especially those produced on the North-east coast are large in grain, thin in skin and of quality highly favored in the Japanese markets. These provide the usual diet of the people in this country and the crop chiefly meets the domestic consumption. In 1936 the area under cultivation was 230,000 tyobu, and the producing 760,000 koku.

Millet is of considerable importance among the cereals grown, since many of the peasants depend upon it as an economical food. It is largely cultivated in the north (about five million koku a year) but even so the importation from Manchuria forms a significant item in Korean imports, the amount reaching about a million koku a year.

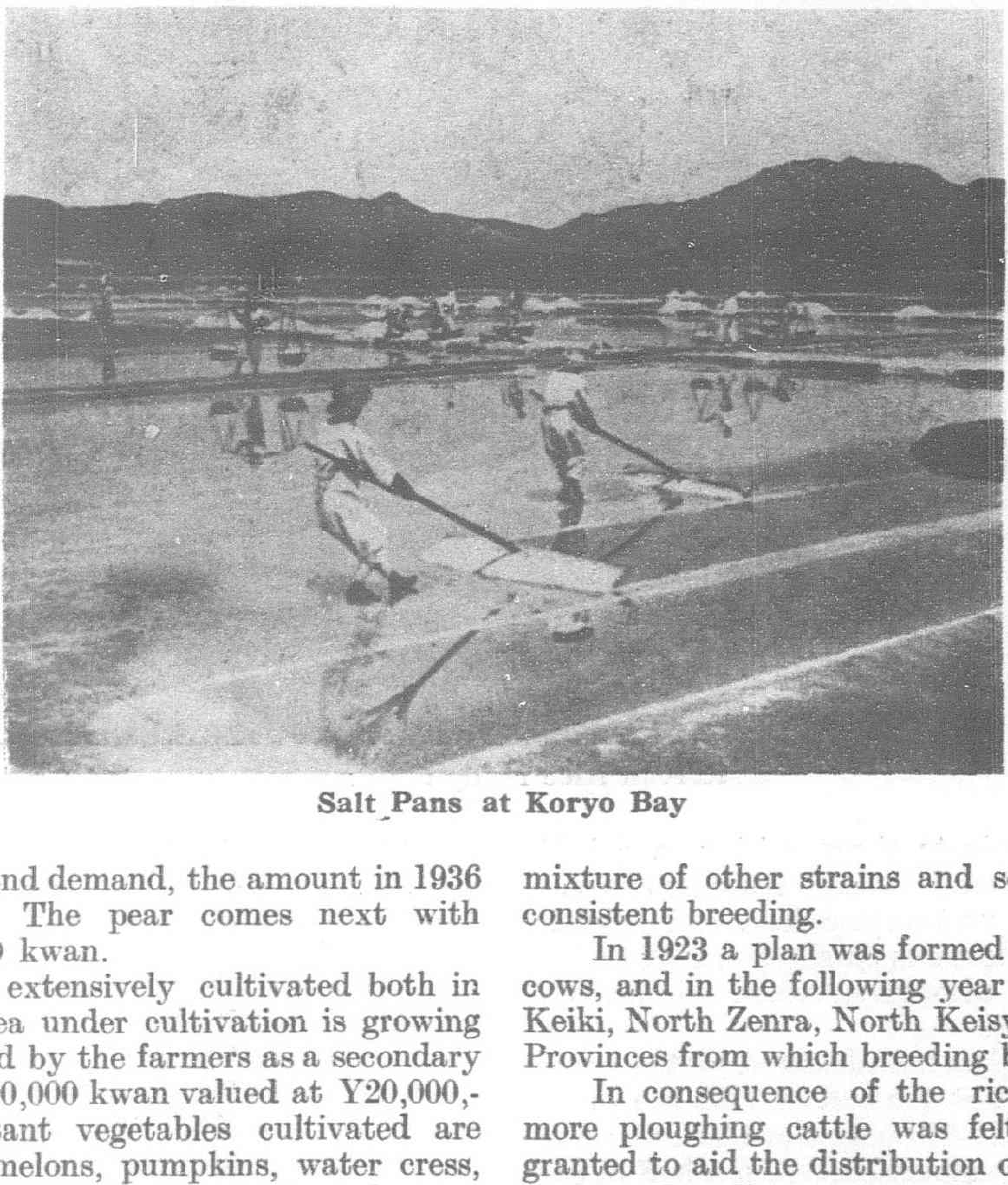
Corn has hitherto been used only for edible purposes, but now there is an industrial demand and the production is increasing year after year—855,000 koku in 1936.

Cotton has been cultivated from very early times, yet until quite recently the production was barely sufficient to cover domestic needs. It was only through the efforts of the authorities that real progress was witnessed in this important branch of agriculture. In 1906 a cotton-plantation was started in Moppo to carry on the tentative cultivation of American cotton. Its superiority over the native species being fully demonstrated, cultivation was assiduously encouraged in the south. 176,000 tyobu yielding as much as 159,000,000 kin in 1933. Along with increase in production, its export is also steadily growing. This is very welcome since Japan is badly in need of cotton for her ever-extending textile industry. From 1933 a ten year plan was arranged aiming at the production of 420,000,000 kin of cotton on a total area of 350,000 chobu throughout the country excepting North and South Kankyo Provinces. The Government-General is now diligently encouraging the farmers in the cultivation of cotton. In 1910, the area under cotton cultivation was 60,000 tyobu and the production 21,000,000 kin which in 1936 increased to 228,500 tyobu and 137,000,000 kin.

Hemp occupies an important position among the special products of Korea. In 1910 only 18,600 tyobu were under hemp cultivation producing 1,749,700 kwan but by 1936 these had increased to 26,500 tyobu with 4,800,000 kwan. China grass is cultivated exclusively in the south on account of climate. In 1936, 1,400 tyobu under cultivation produced, 120,000 kwan.

Sugar-beet was started experimentally in 1906. Having obtained satisfactory results, its cultivation has since been encouraged with the aid of subsidies for distribution of improved seeds. Experiments carried on by experts for a number of years prove that Heizyo and district were best suited for its growth and the area in 1931 reached one thousand chobu with a production amounting to 35,370,000 kin. In 1920 a sugar factory was established at Heizyo by the Japan Sugar Manufacturing Company as a pioneer plant. The cultivation of sugar-beet was discontinued from 1932 because the soil and the climate, upon further careful experimentation, proved to be ill-fitted so that the production cost too high and producers suffered heavy losses even with the financial aid of the Government-General.

Fruits of many kinds are grown owing to the favorable conditions of the climate and soil. In recent years every encouragement has been given to induce the extensive cultivation of "select" species instead of the native ones which are generally of a very inferior quality, and in consequence some of the fruits now grown such as apple, pear, grape, peach, persimmon and chestnut, have the credit of being superior to those grown in Japan. Thus with the improvement in quality, as well as in productivity, Korean fruit has become an important item of export to Japan and elsewhere, the amount witnessing increase each year. The apple leads both in production and demand, the amount in 1936 reaching about 15,790,000 kwan. The pear comes next with 3,630,000 kwan and grapes 390,000 kwan.



Salt Pans at Koryo Bay

Potatoes and sweet potatoes are extensively cultivated both in the north and the south. The area under cultivation is growing year by year and they are consumed by the farmers as a secondary foodstuff. The production is 200,000,000 kwan valued at Y20,000,000 per year. The most important vegetables cultivated are cabbages, turnips, melons, water melons, pumpkins, water cress, and garlic. The cabbage produced in Kaizyo is best known. With the increase of Japanese in recent years other varieties are being introduced.

Sericulture

Sericulture in Korea is a family industry, and, for the most part, is carried on as a side-line. The Korean climate and soil are highly favorable for the raising of silkworms, but little progress was made as the species reared were of inferior kinds, while the method of rearing them was very primitive and the cultivation of mulberry trees, on whose leaves they feed, received no attention. The Government since 1910 has employed every means to secure thorough improvement in both quality and quantity of cocoons, and regulations were issued in 1919 to provide for the examination of egg-cards, prevention of diseases, care of mulberry seedlings, etc., and institutions necessary for the encouragement of this profitable business were established in the provinces. The result of all these efforts is already evident in the greatly advanced condition of the industry. The number of families engaging in sericulture in 1910 was calculated at 76,000 and the volume of cocoons gathered at 14,000 koku, but in 1936 the figures were 815,000 families and 722,000 koku.

Reeling was formerly done at home by means of simple implements and for home consumption only, but of late years the development in sericulture has induced the use of modern machines, and reeling-mills now number 74 with an aggregate output of raw silk amounting to 325,000 kwan valued at Y13,600,000, all intended for export. On the other hand, handreeling is still quite common in the country and employs 344,000 families turning out a total production of 176,000 kwan valued at Y5,280,000.

Tussah silk comes from the forests of silkworm oaks in North Heian Province. The production is irregular each year because of climatic and natural adversities. In 1936, 860,000 moths were reared on 786 tyobu giving 8,060,000 cocoons. These are mostly spring silkworms, and the cocoons are exported to Manchoukuo.

Stock-farming

Cattle, raised everywhere in the peninsula, are indispensable to Korean farm-life, for they supply the greater part of the labor required on a farm. Korean cattle are generally of hardy constitution and gentle disposition, while their flesh is very palatable, so they are highly valued as a source of both labor and food. Of late, in consideration of the greater demand in Japan as well as in Manchuria and Siberia, various means have been employed by the authorities to help the development in cattle breeding, for which the land offers many advantages, and with such good effect that cattle increased from 700,000 at the end of 1910 to over 1,700,000 at the end of 1936, and the number exported (chiefly to Japan Proper) from about 20,000 to over 70,000. In 1912, the Government-General issued instructions concerning the distribution, and protection of cattle, the prohibition on slaughtering cows with calf, and the prevention of diseases. In 1914 rules were enforced for preservation of the Korean species, preventing the mixture of other strains and so maintaining its high quality by consistent breeding.

In 1923 a plan was formed to provide one bull for every sixty cows, and in the following year certain villages were designated in Keiki, North Zenra, North Keisyo, South Heian and South Kankyo Provinces from which breeding bulls could be more easily procured.

In consequence of the rice increase program the need for more ploughing cattle was felt and a government subsidy was granted to aid the distribution of brood cows. In fifteen mountain districts breeding experts are now stationed who encourage the farmers in mutual help with their cattle and particularly in cases of sudden death of the animals.

Native horses in contrast with the cattle, are very small and poor, averaging less than four feet in height. With the object of making a new variety more suited to the Korean climate, the authorities are now trying cross-breeding between Mongolian mares and Japanese stallions, and the work is chiefly carried on at the horsefarms at Rankoku and Keigen.

Horse Racing in Korea at first was purely for pleasure and a means of gambling and paid no attention to the improvement of the breeding of horses. In October, 1932, the Korean Horse Racing Act was promulgated to be in force from 1933, the provisions of which removed the harmful irregularities and introduced the requirements for the breeding of horses, and Racing Clubs were organized at Keizyo, Husan, Taikyu, Kunsan, Heizyo and Singisyu. During 1936, entrance tickets sold with prize winning rights amounted to Y3,690,000. The Korean Horse Racing Association has now been formed to promote the interests of the Racing Clubs and to control the contests.

This plan in Korea was formed with the intention of assisting industries as well as national defense. Suitable mares imported from Japan Proper and Korean bred mares of good quality are crossed with the best stallions, so that strong useful horses can be produced.

From 1936, an eight year plan has been in force to obtain 40,000 of the best horses of this improved breed, and under it the stallions are all owned by the Government. Small sized and large cart horses are bred as well as riding horses.

Sheep were almost unknown in Korea though goats were kept by some people, but in 1914 a sheep-pasturage was established at Sempo, Kogen Province, and sheep were imported from Mongolia. Since 1919, cross-breeding between Mongolian sheep and breeds of foreign origin has also been carried on there, while to encourage private enterprises a number of sheep have been distributed among stock-farmers. In 1924 this pasturage was combined with the Rankoku stud-farm in the same province from economical considerations.

Because of the general conditions at home and abroad the plan for the encouragement of sheep raising is one of the important national policies. A new plan was started in 1929 to increase the number of sheep and the six provinces of north and west Korea were selected as sheep raising regions, in which the smaller farms were urged to keep a few sheep. The aim was that there should be 100,000 sheep in ten year's time. The objects were to provide both wool and mutton, for which purpose the "Corridale" breed was selected. For the first five years, 2,500 head were imported each year from Australia and New Zealand, which were kept on special farms, and the stock from them was distributed among the farming households for further breeding purposes. In August, 1934, for the proper direction of this industry a national Sheep Breeding Farm was established in Meisen County, North Kankyo Province where sheep are bred and distributed. To encourage private sheep raising, a subsidy is granted by the Government-General to aid in the provision of sheep-folds, for the production of mutton for food and wool for manufactures, to meet the cost of lectures on sheep raising and for sheep fairs. Special bounties are also given when purchases of sheep of superior quality are made.

Korean Rice ready for Export

Pigs and Poultry improvement has been fostered by the import from Japan of superior breeds, and at the end of 1936 the former totalled 1,570,000 and the latter 7,120,000 both three times as much as the number kept at the time of annexation. About half of each are of improved varieties.

Bee-culture has been extensive chiefly in the provinces of Kogen, North and South Heian and North Keisyo, and from ancient times honey has been in use for food and medicine. The total value of honey and wax produced in 1936 amounted to about a million yen. This industry is most suited as a secondary occupation for farmers and has very bright prospects. Recently "Italian, Carnioran," and other strains have been imported, but as yet the number of hives improved remains insignificant.

Cow-hides constitute one of the principal exports. Korean cattle furnish an excellent hide because of its large size and fine grain. The only drawbacks to its value lie in the manner of peeling and drying, and in the presence of abrasions caused by rough treatment, but the adoption of new methods of preparation since 1911, together with the prevention of saddle gall, has led to great progress in the art of preparing the hide for tanning, and at the present time the total output of cow-hides amounts to seven million kin of which 50 per cent is prepared with scientific methods. The tallow, bones, gristle, and hair, formerly thrown away as refuse, are also being increasingly utilized.

Forestry

No nation in the world prospers without paying due regard to forestry. In spite of this, the forests in Korea were long left untended or abandoned, so that good forests, chiefly found in remote mountainous regions, now occupy only one-third of the total area of "forest" lands, which cover more than half the entire peninsula, and the remaining two-thirds is but thinly wooded or entirely denuded. Even those forests still standing and left to take their own course show signs of decay with increasing age, while on the other hand the demand for timber for building material, fuel, pulp, etc., is growing greater each year, so the Government is doing all in its power to secure their conservation and cultivation, besides trying to prevent the reckless deforestation which used to be customary among the people at large.

Throughout the country there are many varieties of plants belonging to both temperate and frigid zones, the result of the wide difference in climate and soil between the north and south. For instance, in the basins of the northern rivers, the spruce, birch, larch, etc., are to be found, and in those of the central and southern part the red and black pine, oak, alder, bamboo, etc.

Formerly no system existed for the care and management of forests, of which 80 per cent was State-owned, and the people enjoyed freedom to exploit all except certain forbidden forests, but even these became less inviolable toward the latter days of the old regime, resulting in unscrupulous felling of trees. In 1908, the Korean Government, acting in conformity with Japanese advice, promulgated a forestry law, but after annexation a new law was issued, providing among other things that State unreserved forest lands may be leased out for the purpose of afforestation and ultimately transferred to those successfully accomplishing the work. The area of lands thus leased now reaches over 1,390,000 tyobu, of which about half has been transferred to successful cultivators.

There are about 3,500,000 tyobu of forest land called *Enkorin* (Yunkorim) among the state owned forest lands. "Enkorin" came into possession of the State largely in the following manner :—

(1) Prior to the enforcement of the old forestry law there had been a considerable area of forest lands lawfully occupied and cared for by private owners. But the Design (Wald Bäute) of the forests failed to reach the standard required for private ownership and at the time of the Government survey of Forest lands the owners were not recognized.

(2) Owing to the failure of private owners to file their land registers with the Government in accordance with the requirement of the old forestry law, the lands were recovered by the State at the time of the Land Survey. For example, the forest land formerly owned by Buddhist monasteries were lost by them due to this failure, though the ownership could be proved by old documents and other historical evidence.

These "Enkorin" consist of small areas lying between or adjoining other privately owned lands and the conditions and intentions of their use differed in no way from privately owned forests. Yet their ownership by private individuals was not granted simply because of the difference in the Design (Wald Bäute) and of the failure by the occupants to observe Government regulations. This, however, caused complaints concerning the State procedure, which could not be ignored. Furthermore, these forest lands were widely scattered and adequate care by the State was difficult. On the other hand, to dispose of them in any other way than to hand them back to the former owners would be a threat to their livelihood. Again, in the care of the forests, because ownership by private individuals was not recognized by the State, their occupants were not attentive in giving adequate care to them, consequently the State Reforestation program could not be fully carried out.

For these reasons the special law concerning the cession of “ Enkorin ” was enacted in April, 1926, and in December of the same year regulations for the enforcement of the law were promulgated, and in February, 1927, the law went into effect. By this law the forest lands were returned to the occupants without charge, and by this procedure it was hoped to avoid further complaints and to assist the Reforestation policy. The occupants were given opportunity to apply for such grants between February 1, 1927 and January 31, 1928. The State was to make investigations and act according to the findings. During that period the Government received 1,144,053 applications for 1,149,920 lots of forest land covering a total area of 3,416,433 tyobu.

This policy of cession was to continue for eight years beginning with 1927. By end of 1935 the disposal of “ Enkorin ” was completed resulting in the cession of 3,780,000 tyobu.

There are 10,680,000 tyobu of forestlands under private ownership, of which 180,000 chobu belong to the Buddhist temples. In addition, large areas of State unreserved forestlands are being transferred to the people under the Forestry Act or under the Act for granting special forests called “ Enkorin.” Therefore in future the area of private forestlands will reach 11,730,000 tyobu, or about 70 per cent of the total (16,340,000 tyobu). These *private forests*, however, are generally uncared for and under standing trees there are only 7,690,000 tyobu. Others are barren. Of the latter 210,000 chobu require sand drift prevention work before trees can be planted.

Rice Seedlings for Transplanting

Coniferous trees, such as red pines comprise 60 per cent of the standing trees in these forests and the growth is very sparse. Undoubtedly even these are much improved as compared with conditions at the time of annexation,—the bare red mountains are now clothed in green. The reasons for the impoverishment of these private forests are that people cared only for red pines and recklessly cut others, oaks and other broad-leaf trees. They felled the trees and gathered leaves for fuel and fertilizer. To remedy this situation the Government General commenced new means of guidance from January, 1933, insisting on three essential points. (1) Preservation of forestlands, to recover the productive power of the land, to save the expense of afforestation, and to obtain woods and undergrowth by natural rather than by artificial growth. (2) Efforts directed on growing wood for fuel before timber for building, on making more profits from the use of good forestlands, and on forming fields and stock farms. (3) Protection of young trees and undergrowth and restriction of gathering of blossoms and herbs, but encouragement of the profitable felling of large trees and the increase in the varieties of trees.

At present five million tyobu of the forest land is *state owned* of which one hundred and twenty thousand tyobu is reserved for university research and as national parks. The great forests along the basins of the Yalu and Tumen rivers cover an area of more than two million tyobu having five billion cub. ft. of lumber.

Forest Products

For the purpose of facilitating the exploitation of forest products in the regions along the upper reaches of the two rivers, several forest railway lines have been projected and are now being constructed in that part of north Korea. 108 kilometers of track was finished in 1936 permitting the transport of 128,000 cubic meters of lumber and it is hoped that on the completion of the whole network of lines more than 330,000 cubic meters of useful lumber will be carried out of these virgin forests.

The first step taken toward afforestation was the creation of *model forests* in 1907 on the hills near Keizyo and Heizyo, followed later on by similar undertakings near the towns of Suigen, Kaizyo, and Taikyu. In recent years re-clothing of denuded woodlands around large centers has been taken up extensively to prevent sand-drifts and to afford a future supply of timber, and the area of State forests so covered up to 1936 totalled 72,230 tyobu and seedlings planted 253,815,000 in number.

In connection with the Government Agricultural Experimental Station, three public nurseries or *seedling plantations* were started in 1907, and now each province maintains one or more. The principal seedlings raised at these places are the pine, oak, chestnut, poplar, larch, etc., and at first distribution was made gratis to people interested. Every possible opportunity was seized by the authorities to arouse the interest of the people in afforestation. Schools were provided with lands on which to plant trees, and April 3, the anniversary of the death of the first Emperor of Japan, was fixed upon as Arbor Day, on which day universal plantation is encouraged. During the present regime, by Government and private undertakings more than a million tyobu (=three million acres) have been planted with over four billion trees. The whole landscape is gradually changing and the general rainfall will in time be increased, while at the same time the danger from floods will be reduced.

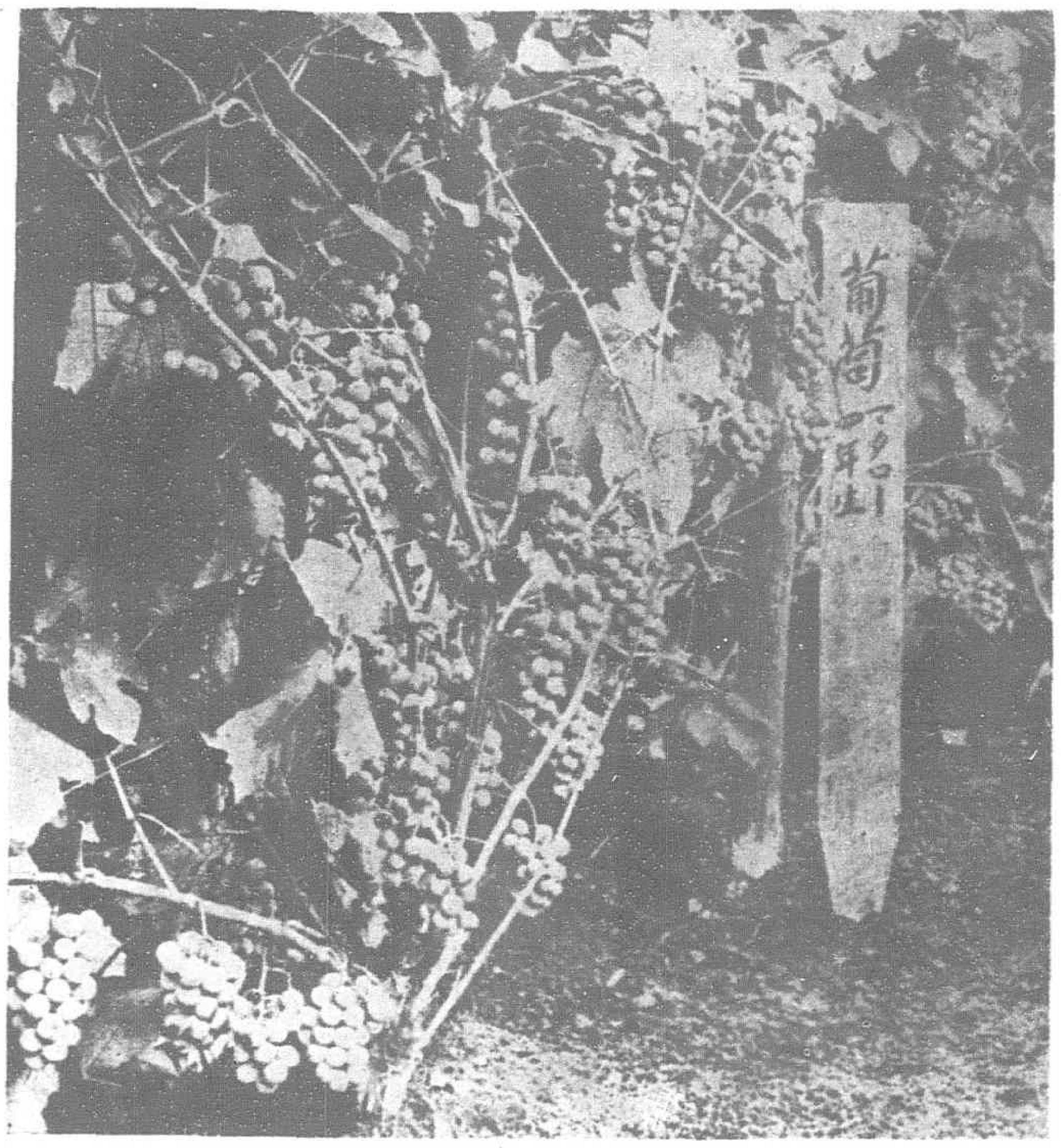
Scientific examination and *investigation of forest plants* being necessary for the improvement of forestry on a sound basis, work along that line carried on since 1913 was much enlarged in scope and more experts were engaged, and in 1922 an experimental forestry station was established in a suburb of Keizyo.

For the *conservation of forests* there have been only fifty-three stations with a staff of only ninety forest keepers. Thus one keeper was in charge of an average of 24,000 tyobu. There have therefore been continual cases of clandestine tree felling, secret cultivation and mountain fires. For instance in 1930, 38,000 tyobu of beautiful forests were reduced to ashes. To remedy this situation the Government, between 1932 and 1934, increased the number of forest stations by eleven and reinforced the staff by adding eleven keepers and 242 assistant keepers to maintain a more vigilant watch. As a result the losses have been very small and the area of forestland wasted by fire has not exceeded one thousand tyobu a year. Even the venturesome “ fire-field tillers ” cannot extend their methods to the good forests.

Among the few forest districts spared the ravages of wholesale deforestation, the most important is the one along the upper reaches of the Yalu and Tumen Rivers on the frontier. The first systematic exploitation of it began in 1906 when a joint institution by the Japanese and Korean Governments with a capital of Y1,200,000 was formed for the purpose. This was the origin of the Government *Forestry Station at Shingishu* which, together with a similar joint enterprise on the other side of the Yalu, forms one of the largest timber supplies in this part of the world. The station is provided with nurseries of its own, so that as trees are felled new ones may be planted in their stead. The timber felled is mostly rafted down to the lumber yard at Singisyu, where it is sawn and sold, the profit from the undertaking going to the Treasury. During the year under review 505,000 cubic meters of logs and sawn lumber valued at Y8,812,000 were sold here making a profit of Y4,790,000.

Korean Fisheries

Girdled on three sides by water, with a coast-line measuring more than 10,000 miles, Korea is favorably situated for the development of her fisheries. Owing to the presence of innumerable islands and indentations of the coast, as well as to the great influence of both warm and cold currents washing her shores, there is abundant marine life and the principal varieties of fish already known number some 80. But these natural advantages were almost wasted on the native fishermen who knew but little of modern methods of fishing. Since the establishment of the present regime, improvements have been introduced into fishing boats, gear, and methods, and encouragement given in various forms for the increase of marine production, so that the value of catches and prepared aquatic products which was only ten million yen at the time of annexation, rose to over one hundred and sixty million yen in 1936 showing about sixty-fold increase.


Grapes are produced in many districts in Korea

The first *law for fisheries* was published in 1909, and was replaced with a new law in 1912, providing for the security of exclusive fishing rights over a certain area of water, the prohibition of certain acts prejudicial to fishing in protected areas, the granting of permits to applicants according to custom as far as possible, and the prevention of individual monopolization of any fishing ground. The law was accompanied by regulations for the protection and control of fisheries placing some restrictions on the manner, season, and place of fishing, prohibiting trawling within specified zones in Korean seas, and limiting the number of whaling boats and diving apparatus. Steps were also taken to suppress the poachers appearing on the western coast, thus rendering their visits far less frequent than formerly. In view of the sudden increase, in recent years, of fishing boats engaged in fishing off the Maritime Province, on the Eastern China Sea and the Yellow Sea, the Guard-boat *Teru-Kaze Maru* was constructed in 1936 to watch and protect the deep sea fisheries.

The first *aquatic investigation* was undertaken by the authorities in 1912 with regard to the distribution of Korean fish, their movement, reproduction, and seasons of visit, suitability of methods employed in catching them, preparation of salted and dried fish for export, and artificial culture of certain kinds of fish and sea-weeds, and in 1922 a central organ called the Fisheries Experimental Station was established at Fusan in order to carry on the work more systematically. These and other efforts toward improvement of the fishing industry have already been productive of good results. Nothing, however, has contributed more to the recent progress of Korean fisheries than the increased immigration of skilled Japanese fishermen, by whom the native fishermen have been taught to engage in deep sea fishing—a new profitable venture for the Koreans, whose activity had hitherto been confined to off-shore and inland waters.

To teach practical knowledge of scientific catching, manufacture and culture of fish and other sea products fishery schools have been established in Reisui, Kunsan, and other sea ports.

In view of the increase of prepared aquatic products for export it became necessary to improve the quality and to prevent all dishonest trading. Thus in 1918 the Government-General promulgated regulations governing the examination and providing for *control of all canned goods*, sea-weeds, fish oil, tomato-sardines, etc., before shipment abroad. As a result the Korean products now enjoy a good reputation both at home and abroad. In 1936 more than 7,400,000 cases valued at Y56,920,000 were inspected and passed.

With a view to promoting common interests among fishing communities, regulations were promulgated in 1912 authorizing the formation of *fishermen's associations*. These associations increased year by year until they reached 195 in 1936 with a combined membership of over 123,000, and their joint activities consisted in the purchase of fishing tackle, sale of fish, advance of funds, lending of boats, equipment of alarms and signals, arrangement of mooring places, etc. All are thriving under the supervision and guidance of the authorities, and not a few are assisted financially by the Government.

As early as 1900 an association was founded at Husan by fishing parties coming from Japan for protection of their business, and gradually extended the scope of its work to include the entire peninsula, but in 1912, on the enforcement of the new fishing law, change was made in its constitution to permit of Koreans becoming members, and it enjoyed an annual subsidy from the Government. It then remained unchanged until 1923, when it was re-organized under the ne wregulations, and a Korean Fisheries Association was formed in Keizyo as a central institution with a similar institution in each province. The Association engages chiefly in such works as rescue at sea, free medicine for the sick, inquiry into fishing conditions, guidance of fishermen in their business.

In connection with fisheries the famous Hanyo (women divers) of Quelpart island are worthy of mention. These women now numbering 8,000 are engaged in catching sea-ear, and sea-weeds by diving into the deep sea, and each earns from Y1 to Y2 a day. During the warm season they migrate to the mainland for fishing purposes. The total earnings of these women on the south coast and in Quelpart island together amount to one million yen a year. They have a Fisherwomen's *Co-operative Society and for the promotion of their welfare* the Local Government of the island is doing all possible.

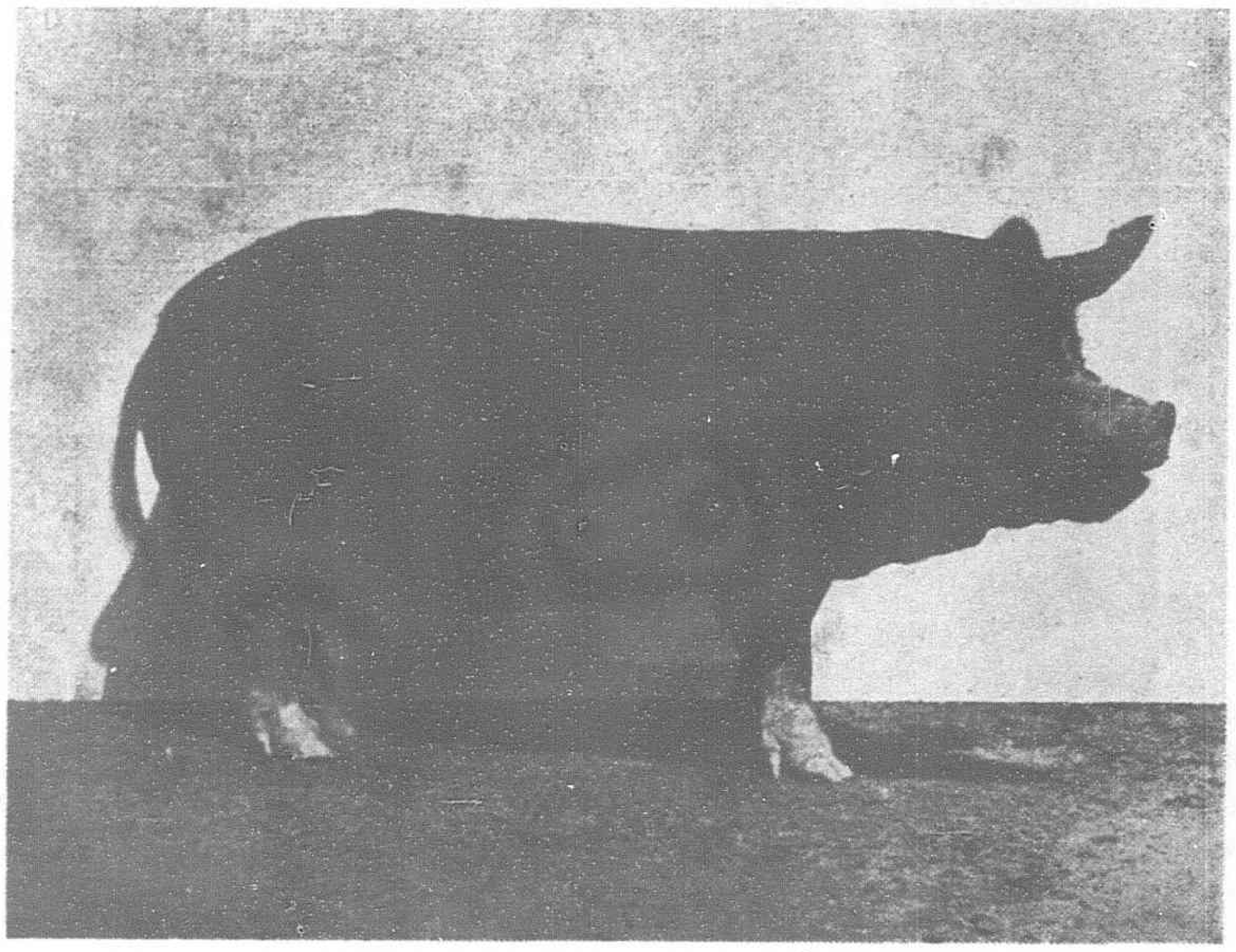
MARINE PRODUCTS

	1936	*1935*	*1934*
Sardine	Y26,811,000	Y16,638,000	Y 9,171,000
Mentai (Alaska Pollack)	5,769,000	4,191,000	4,050,000
Mackerel	4,780,000	5,438,000	5,717,000
Sciaena	4,754,000	3,871,000	3,621,000
Herring	3,000,000	2,539,000	2,549,000
Anchovy	2,785,000	3,365,000	4,183,000
Lobster, Prawn and Shrimp ..	2,552,000	2,345,000	1,881,000
Hair-tail	2,201,000	1,912,000	1,932,000
Horse Mackerel	1,803,000	1,053,000	1,634,000
Plaice	1,626,000	1,540,000	1,264,000
Cod	1,385,000	1,481,000	1,541,000
Sea-bream	1,295,000	1,322,000	1,298,000
Cybium	1,115,000	1,200,000	1,255,000
Nibea	1,077,000	1,026,000	1,078,000
Shark	705,000	647,000	524,000
Yellow-tail	656,000	485,000	687,000
Crab	369,000	284,000	393,000
Oyster	338,000	344,000	337,000
Sea-ear	313,000	375,000	395,000
Clam	270,000	263,000	178,000
Others	11,617,000	12,455,000	10,601,000
Total	Y79,879,000	Y65,966,000	Y57,798,000

Mining in Korea

After the Japan-China War (1894-5) a number of foreigners sought concessions of various kinds in Korea. A gold mine in the district of Unsan was first conceded to an American by a special charter in April 1896. Following this concession foreign diplomats in Keijo demanded similar privileges from the Korean Government. In compliance with these demands the mines in Keigen and Shojo were leased to Russians, the Kinjo mine to Germans, the Insan and Suian mines to Englishmen, the Shokusan mine to Japanese, the Shojo mine to French, the Kosho mine to Italians, and the Kapsan mine to Americans. On the establishment of the protectorate regime, a *mining law* was promulgated in July, 1906, and the mining administration in the country became unified and consolidated. Though the law continued in force after annexation, it was soon found to be out of date and the present mining law was framed and enforced in 1916. The new law ordained that a mining right could only be granted to Japanese citizens or to legal corporations created under the Japanese law, and the minerals subject to its provisions were increased in number from 17 to 33. With regard to mining permits, the principle was adopted, except for certain reserved localities, of awarding them according to priority of application filed with the authorities, and the mining right being treated in the same manner as real estate it had to be confirmed by legal registration. The use and expropriation of land necessary for mining purposes were then determined, while provisions were made to meet other mining conditions. At the same time the mining rights already secured by foreigners under the old regime were strictly respected and made valid and heritable by other foreign individuals or corporations having their head office in Korea.

Of Korean mineral products, *gold* occupies the most important place, and the most noted gold mines in the country are the Unsan Mine operated by an American organization called the Oriental Consolidated Mining Company, and the Syozyo and Suian mines by the Nippon Kogyo. The Government, with a view to encouraging the exploitation of new gold mines, grants subsidies to persons actually engaged in experimental operations in prospecting lots; and also in order to facilitate the sale of low grade gold ores to refineries in Chosen, a subsidy is granted to cover the freight charges of such ores from a mine to the nearest railway or waterway.



A Berkshire pig in Korea

Formerly the general mining industry was conducted in a primitive way except where certain foreigners were concerned. It was not until after annexation that Japanese began to play an important rôle in the Korean mining field, when the Government had urged mining firms in Japan to invest funds and start operations. At first the capitalists turned their attention to iron and coal and later to gold and other minerals. The chief enterprises thus organized are the smelting plant of the Nippon Mining Company at Chinnampo, the Fuel and Mineral Experimental Plant at Roryoshin, Keizyo, the iron foundry of the Mitsubishi Iron Company at Kenjiho, and the plant of the Korea Refinery Company at Tyoko near Kunsan.

Nearly every kind of useful mineral, except tin, sulphur, petroleum and asphalt, is to be found in plenty in the country, especially gold, iron, coal and graphite. During the European war the mining boom was unprecedented, but the post-bellum depression reduced the demand and caused the closing of mines in rapid succession. From 1931 a great recovery has been made, aided largely by the increased price for gold, and new mines have been opened in all parts of the peninsula, leading to the present prosperous condition of mining. In the following table is given the production values of the principal minerals in recent years, as compared with those of the time of annexation. The great increase in gold production will be noted.

MINERAL PRODUCTS (IN YEN)

Mineral	*1936*	*1935*	*1934*	*1910*
Gold	49,909,775	38,320,921	33,214,914	3,744,957
Placer Gold	9,443,928	7,136,796	5,323,344	821,609
Gold and Silver Ore ..	9,373,643	6,520,959	2,511,481	262,092
Silver	2,830,135	2,558,130	1,468,579	6,555
Copper	3,272,926	1,535,797	933,032	—
Lead	793,973	388,762	306,329	—
Pig-iron	7,866,613	7,332,318	7,722,088	—
Steel	6,533,011	6,764,148	4,178,860	—
Iron ore	1,429,840	1,279,269	879,810	421,462
Tungsten ore	2,293,792	1,388,952	734,210	—
Graphite	1,010,833	1,207,568	524,804	153,477
Coal	13,301,027	11,925,149	9,940,566	388,781
Others	2,370,159	1,698,632	1,434,823	21,438
Total	110,429,655	88,039,201	69,172,840	6,067,902

Commerce and Manufacture

From olden times it has been customary among the Koreans to sell and buy at *markets* periodically held in various important towns, and even to-day the greater part of the internal trade is carried on in this manner. A market is, as a rule, opened every fifth day, and on that day people gather from far and near to get their supplies of food, clothing materials, cattle, and all necessaries of life. Such markets at present number 1,500, and their annual transactions amount to over Y314,354,000. Though shops flourish in the larger towns, the markets still constitute an important element in Korean commercial life, and some of them have a national fame, like the medicine market in Taikyu and the cattle market in Suigen.

This system of trade, which was undoubtedly called into being by necessity, has of course its own merits and demerits, and when properly regulated and protected contributes much to local economy. So in September, 1914, regulations for markets were published, providing in detail for their formation, management, and supervision. But things are running their course, and with the growing influence of modern shops the market system is gradually yielding to a more advanced form of business.

Stock Exchanges carrying on transactions by description or by samples, are held daily, and are subject to strict Government control. The oldest and largest is the one in Zinsen (opened 1899) which was incorporated with that of Keizyo following the promulgation of new regulations in May, 1931. The Zinsen Exchange deals in rice and beans while the Keizyo one handles both grain and shares. Under the new regulations other markets in Kunsan, Moppo, Taikyu, Husan and Tinnampo also obtained charters for dealing in grains only.

Specific *regulations for business companies* were issued in 1911, subjecting all to licence by the authorities, thereby preventing the establishment of illegal or bubble corporations. In 1920, however, these regulations were abolished that more freedom might be enjoyed by those starting companies, joint-stock or otherwise, except insurance companies and the above stock markets, which differing from other undertakings were left subject to the old provisions. Many companies have come into existence with the general growth of industry. In 1936 there were more than two thousand companies dealing in all branches of industry of which those engaged in commerce or banking numbered over one thousand with an authorized capital of two hundred and forty million yen.

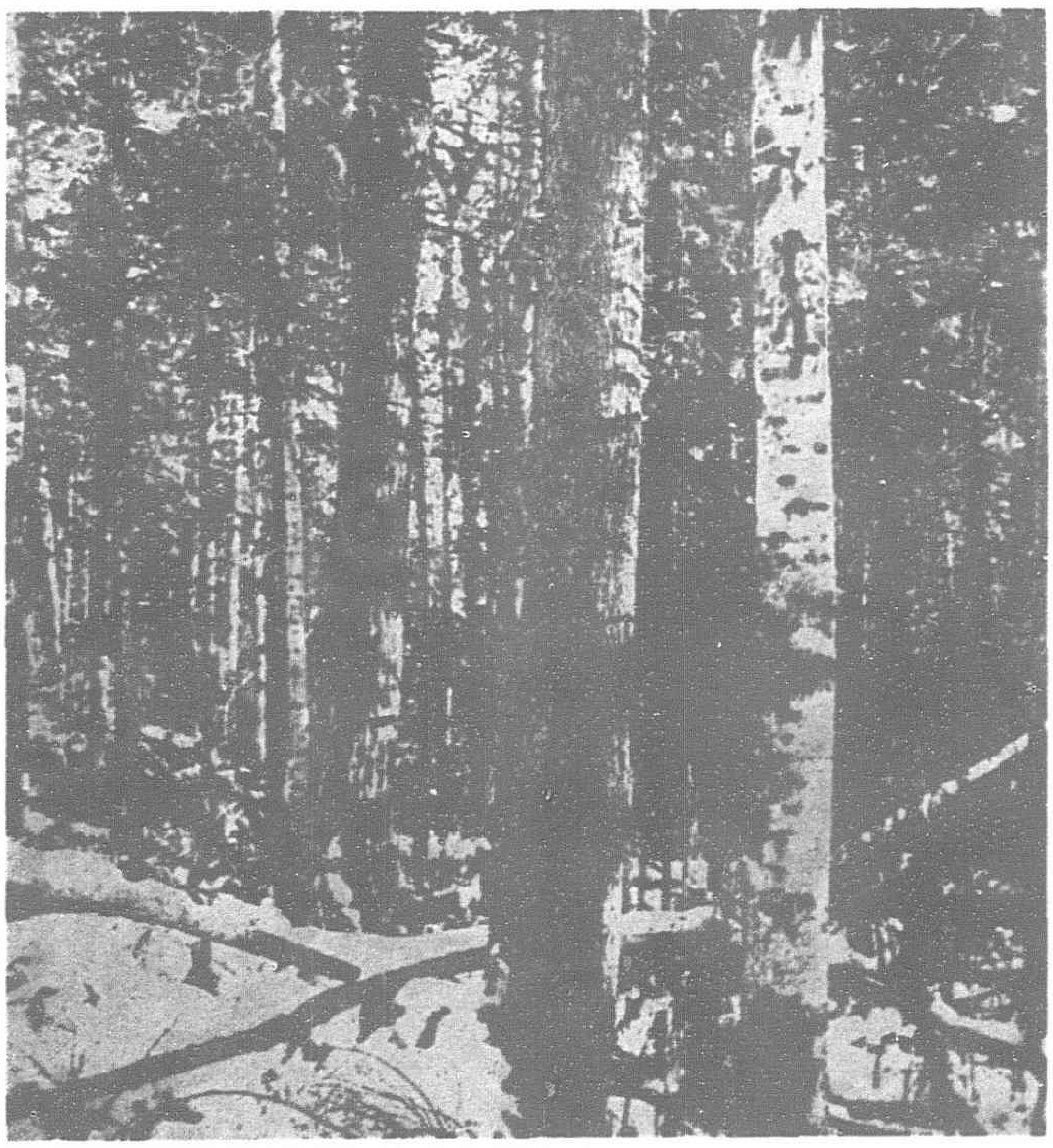
In 1936 there were 36 life insurance companies including two foreign. Number of insured 346,453; amount insured Y519,359,000; Premiums Y17,579,000. Insurance against Loss (Fire, etc.) Number of companies 60 (including 17 foreign); policy holders 298,731; amount insured Y462,567,000; Premiums Y3,831,000.

In order to portray to the general public the business condition of Korea and to stimulate her development industrially, a commercial museum was established in Keizyo in 1912, and later a museum of local products in every province. For the same purpose exhibitions have often been held in Keizyo and elsewhere, and exhibitions in Japan were also made use of to exhibit Korean products as much as possible. In 1925, regulations for *Chambers of Commerce* were issued, whereby separate chambers for Japanese and Koreans were no longer allowed, and only one with a joint membership of both peoples was permitted to exist in any one center. These organs now number 17, all situated in the principal towns, and since 1930 have been called Chambers of Commerce and Industry.

Another important factor to which the commercial development in the peninsula is directly indebted, was the *standardizing* *of weights and measures.* As they had for long no definite standard, entailing a great deal of trouble and uncertainty in business life, a radical reform was introduced in September, 1909, making their units and denominations identical with those current in Japan, though it was not until 1912 that the entire country was brought into line with the system. Further, following the homeland, which adopted the metric system in 1924, it was decided to enforce it in Korea from the year 1926.

Following the rapid development of domestic industries and communications in recent years the demand for oil is increasing remarkably. This demand is met largely by importation from foreign countries. According to the latest trade returns the value of oil imported comes next to that of cotton. In view of the limited resources of oil in the Empire and of the lack of domestic oil refining enterprise if no action is taken the consequences will be most unfavorable to national economy, to national defence as well as to national industry. It is urgent therefore that the balance of supply and demand of oil be maintained, and that oil refineries be established. As the latest situation, both foreign and domestic, called for a speedy control of oil by the Government, the *Oil Business Law* was promulgated in Japan Proper in March, 1934, and similar regulations were enforced in Korea from July of that year, to co-operate in a more efficient control.

The essential points of the law are: (1) Official permit should be obtained in order to engage in importation or refining of oil. (2) Those engaged in oil business are required to prepare annual estimates of their operations for official sanction and to hold in storage a certain quantity of oil at all times to meet any emergency demand. (3) In view of the vital importance oils have on the national life the Government retains the power to order the regulation of prices and quantities and the improvement of plants and other matters affecting the public interest. (4) In supervising the whole oil business the Government will punish severely any person violating the said orders. Under the new regulations two oil firms, one in Genzan and one in Husan obtained charters to operate oil refineries, and eight companies, five domestic and three foreign, who supply a large part of the demand in Korea obtained permits for the importation of oils.



Forest trees of North Korea

The Koreans of old were excellent artists and workers in weaving, ceramics, and metal casting, and that these arts once attained a high degree of development is evidenced by the many excellent works still left, chiefly in the form of domestic industry. On the advent of the present regime, therefore, efforts were put forth to revive these ancient arts, as well as to introduce modern mechanical arts, and one of the first steps taken to that end was the establishment in Keizyo of an up-to-date technical school in 1909, followed by the erection of a *Central Laboratory* in 1921 for the exclusive conduct of scientific experiments in connection with all branches of Korean manufacturing industry.

The *manufacturing industry,* though still in its infancy, has made such advance since 1916, being favorably influenced by the European war that the total value of manufactured articles amounted to over Y730,800,000 in 1936, this being over eighty times as large as that for 1910 in which year they were valued at Y9,000,000. Korea holds out promise for great development in manufactures, as she has a large supply of material and labor—two factors most favorable to the expansion of industrial interests—so that with sufficient capital and the equipment of modern factories Korea can hardly fail to become an important industrial country. Except for some few run by Japanese and foreigners, factories on modern lines were practically non-existent prior to the European War, but the abnormal conditions induced by that event quickly brought about a change, and in 1936 the number of factories and workshops, increased to 6,000 employing about 188,000 hands, compared to only 150 employing 8,200 hands in 1910.

The most important manufactures are:

(1) Cotton, hemp, and silk tissues, the total value of their output increased from Y5,000,000 in 1911 to Y50,000,000 in 1936 though the demand for them is still largely met by imports. While the larger part of the raw cotton is still exported to Japan, owing to the absence of skilled workers and capital, cotton manufacturing was started on a large and systematic scale by the Chosen Spinning Co., at Fusan in 1922.

(2) Paper, production of which increased from Y382,000 in 1911 to Y7,420,000 in 1936 is partly of home and hand make. Of late years the demand for foreign papers has grown considerably, the total value imported rising from Y800,000 in 1911 to Y17,450,000 in 1936.

(3) Cement Manufacture was first started in 1919, by the Onoda Cement Co. near Heizyo. Later branch factories were erected north of Gensan and in Komosan. The Tyosen Cement Co. in Kaisyu and Asano Cement Co. in Hosan together with the Onoda Co. produce a value of Y1,258,000. Other ceramic products such as potteries, glassware, bricks and enamel ware also increased year by year. In 1936, the total production was Y7,250,000.

(4) Sake, the demand for which increased with the growth of the Japanese population, rose from Y740,000 in 1911 to Y8,200,000 in 1936 while the import from Japan amounted to Y1,250,000. For Korean consumption the production of Korean wines amounted to Y70,000,000 in 1936 of which more than half were the cheaper qualities of fermented Rice Wines used by the mass of the people.

(5) With the progress of the program for increase in the yield of rice, greater quantities of fertilizer are now in demand. To meet this, the " Tyosen Tisso Kaisha " (Korean Nitrogenous Fertilizer Company) was established in Konan, South Kankyo Province, and the factory, run by hydro-electric power, started in 1930. The production in 1936 was 500,000 kilotons of which sulphate of ammonium was 395,000 kilotons, and phosphate of ammonium was 67,000 kilotons.

(6) Brass and other metal works, formerly consisting of crude articles for daily use, are now being produced on a larger scale to the yearly amount of about Y1,400,000 but the larger part of the supply still depends on import.

(7) Leather, with an output of about two million yen has a promising future. Several tanyards have been established, the largest of which is at Yeitoho.

(8) Sugar manufacture was started at Heizyo in 1920 by the Japan Sugar Co., from beets grown on its own or on specially selected farms. Since 1931, however, the cultivation of sugar beet was discontinued and the refinery now operates with raw sugar imported from Hawaii, Java and Formosa. The production of refined sugar in 1936 was 47,760,000 kilograms (including corn sugar) of a value of Y8,860,000.

(9) Matting and slippers, etc., specially made of a Korean reed " Wangol," give promise even as articles for export, the output in 1936 being Y1,599,000.

(10) Flour, vegetable oils, rayon, dyeing, electric bulbs, enamelled ironware, fishing nets, washing soap, lacquer wares and bamboo products are also worthy of notice among profitable enterprises.

Oil from Coal

By C. M. CAWLEY, Ph.D., M.Sc., A.R.C.S., D.I.C., in The Mining Journal

Before reviewing the present position with regard to the production of oil from coal, it is perhaps as well to look again at the reasons which make this production of such widespread interest. The figures for the world output of coal and petroleum indicate the first and most powerful reason very clearly. During the last 24 years the output of coal, as the following table shows, has increased by only about eight per cent, while that of petroleum has increased by over 500 per cent.

World Fuel Output (million tons)

	Coal (and lignite)	*Petroleum*
1913	1,237	51
1924	1,222	135
1929	1,375	198
1934	1,126	207
1937	1,333	275

The rate of increase of coal production has been influenced by many factors, notably increased efficiency in the use of coal. The competition of oil has, however, played a part, and it is evident that for some purposes oil possesses advantages over solid fuel. The extent of the reserves of oil is not definitely known, but if the present trend in consumption is maintained, it is generally recognized that the supply of oil must fail long before that of coal.

The Chief Processes

There are three main processes for the production of oil from coal, namely carbonization, hydrogenation and hydrocarbon synthesis.

The gas and coke oven industries both employ high-temperature carbonization, and two primary oil by-products are obtained, namely tar and benzole. The tar, which is obtained in a yield of about 10 gallons per ton of coal, may be distilled to yield mainly creosote (40 per cent) and pitch (60 per cent). Creosote can be used as a boiler fuel; it may also be used in diesel engines of the slow-running type, but it is unsuitable for use in the modern high-speed, diesel engine. Benzole is recovered from the gas in a yield of two to three gallons per ton. After refining, it provides an excellent motor fuel, which on account of its high anti-knock value is generally used as a blending fuel; its chief disadvantage is its high freezing point (—11 deg. C.) which renders it unsuitable for use as an aviation fuel.

The main product from low-temperature carbonization is semi-coke or smokeless fuel; the yield of tar is about 18 gallons per ton, and the spirit recovered from the gas amounts to about 2½ gallons per ton. These products differ from those of high-temperature carbonization in containing a greater proportion of hydrogen, but considered as fuels the tar and tar oils, without further treatment, can again be employed only for boiler firing; the tar oils can, however, be used in the high-speed diesel engine if certain "dopes" are added. The gas spirit resembles benzole in having a high anti-knock value, but differs from it in possessing a lower freezing point; low-temperature gas spirit thus forms a satisfactory aviation fuel.

Coal contains a lower proportion of hydrogen to carbon than does petroleum, and the hydrogenation process is designed primarily to supply additional hydrogen and at the same time to effect a degradation of the coal substance. This is achieved by the use of a high pressure of hydrogen, normally 200 to 300 atmospheres, and a temperature in the neighborhood of 450 deg. C. The treatment of coal or tar, for the production of motor spirit, normally involves an initial hydrogenation in the liquid phase in the presence of a finely-divided catalyst. The products from this treatment are distilled, heavy oil being treated again in the liquid phase, and middle oil, a fraction boiling within the range 170 deg.—325 deg. C., subjected to hydrogenation in the vapor phase over a fixed catalyst. For the hydrogenation of coal in the liquid phase a compound of tin is generally used, while molybdenum disulphide or tungsten disulphide provide the catalyst for the vapor-phase treatment.

High-temperature tars, with the exception of vertical-retort tar, are not in general amenable to hydrogenation, but creosote and low-temperature tar are suitable raw materials; high-temperature vertical-retort tar is only slightly inferior to low-temperature tar. The treatment of these materials yields an approximately equal volume of motor spirit. All coals of which the carbon content, on an ash-and-moisture-free basis, is less than 87 per cent are amenable to hydrogenation. In addition to the coal actually treated, coal is required for the production of hydrogen and for power purposes; in the complete process the major part of the hydrogen required would be made from the by-product methane, and the yield of spirit is then about 80 gallons per ton of raw coal.

The spirit produced by hydrogenation consists largely of naphthenic and branched-chain paraffinic hydrocarbons, but the process is flexible and aromatic hydrocarbons may be produced if desired. The anti-knock value of the spirit is high, the octane number being about 70 to 75, and aviation fuels may be prepared by the addition of lead tetræthyl. Diesel oils may be made by hydrogenation, but although superior to tar distillates they are inferior to the best petroleum oils. The manufacture of fuel oil presents no difficulty, but it appears at present that lubricating oil cannot be made by the direct hydrogenation of bituminous coal. It is, however, claimed that brown coal yields a satisfactory lubricating oil.

The first step in the hydrocarbon (Fischer-Tropsch) synthesis is one of degradation to carbon monoxide and hydrogen. The essence of the process lies in the use of these to build up liquid hydrocarbons. This is achieved by the treatment of synthesis gas (i.e. a mixture of hydrogen and carbon monoxide in the ratio of 2 to 1) at atmospheric pressure and a temperature of 180 deg. to 220 deg. C. in the presence of a catalyst such as cobalt promoted with thoria. The product consists of a mixture of straight chain olefins and paraffins varying in complexity from gaseous hydrocarbons to solid waxes. In large-scale operation the yield amounts to 120-130 gm. of primary product per cubic meter of synthesis gas or about 65 gallons per ton of coal.

The primary product distils over a wide range and accordingly requires further treatment in order to yield marketable products. The spirit obtained by straight distillation has a lower anti-knock value than that of hydrogenation spirit; the octane number of the synthetic spirit boiling up to 150 deg. C. is normally below 60, whereas that of hydrogenation spirit is about 75. On the other hand, the synthetic product yields a good diesel fuel with a cetene number in the neighborhood of 100. Hydrogenation and synthesis are therefore to some extent complementary processes. If desired, the fraction of the primary product which boils above the diesel oil range may be cracked to yield motor spirit, and it is claimed that spirit of octane number 65-70 may be obtained in yields as high as 80 per cent. An important aspect of hydrocarbon synthesis is that the products are capable of undergoing further treatment by polymerisation or condensation to yield lubricating oils, which possess good viscosity-temperature characteristics and marked resistance to oxidation.

Commercial Development

Research on oil-from-coal processes is in progress throughout the world, and several countries have large-scale plants in operation or their erection in contemplation.

Germany is the biggest producer of spirit. It has been estimated that the total annual capacity of all plants in operation or under construction is 700,000 tons for the Fischer-Tropsch process and 1,900,000 tons for the hydrogenation process.

In Great Britain the hydrogenation process is carried out by Imperial Chemical Industries, Ltd., at Billingham; during 1937 the production of petrol from coal, creosote and low-temperature tar amounted to 117, 000 tons, and deliveries of 87 octane number aviation petrol were made for the first time during that year. The erection near Glasgow by Synthetic Oils, Ltd., of a plant to produce

136-180 gallons of oil per day is approaching completion; the process is one of hydrocarbon synthesis resembling that of Fischer-Tropsch.

Two coal-hydrogenation plants having a combined annual capacity of 36,000 tons of motor spirit, and a Fischer-Tropsch plant designed to produce 25,000 tons of motor spirit per annum are in operation in France.

Japan is reported to be planning the production of large quantities of oil and spirit by hydrogenation and synthesis, and it is understood that several plants are to be constructed. The erection at Fushun of a coal-hydrogenation plant capable of producing 20,000 tons of oil per annum is stated to be practically complete.

The production of oil on a large scale by the hydrogenation process is proposed in Italy. Two hydrogenation plants at Bari and Leghorn, for the treatment of Albanian crude oil were brought into operation during 1938; the combined output of the plants is 240,000 tons of motor spirit per annum. It is reported that the building of further hydrogenation plants will be started shortly in Tuscany and Sardinia.

In Russia an experimental plant for the hydrogenation of lignite has been completed at Kharkov, and it is planned to erect similar plants at various points in Siberia and the Far East.

Considerable interest has been shown in South Africa in hydrogenation and synthesis, and work has been done to examine the suitability of South African materials for both processes.

The Present Position

Three reports concerning the production of oil from coal have recently appeared, and an examination and comparison of the findings of these reports gives a clear picture of the present position and of the general attitude to the subject. In chronological order the reports are (1) Sir David Rivett's Report to the Minister-in-Charge of Development and Industrial Research, Australia, 1937, (2) Report on Oil from Coal by the Sub-Committee of the Committee of Imperial Defence, Great Britain, February, 1938 ("Falmouth" Report) and (3) Labor's Plan for Oil from Coal, Great Britain, June, 1938.

In the first place it must be noted that the contribution which high-temperature carbonization can make to the world's oil supply, though helpful, is necessarily limited. Thus in Great Britain during 1937 the production of motor benzole was 56 million gallons, or slightly more than four per cent of the total consumption of motor spirit, and if all gas works adopted benzole recovery it has been estimated that the total would not exceed six per cent of the nation's requirements.

The contribution made by low-temperature carbonization is smaller but growing; in Great Britain during 1937, for example, it was eight million gallons of tar and one million gallons of refined motor spirit. Owing to the higher yields of oil obtainable from coal by low-temperature carbonization, however, claims have been made that this process should be considered as a means of making a substantial addition to our oil supply. As far as Australia is concerned, Sir David Rivett was unable to recommend the process as a source of motor spirit since there is no economic outlet for semi-coke in that country. The position is different in Great Britain since a wider extension of the use of this fuel is a possibility. In the view of the "Falmouth" Committee, however, there is at present no assurance that there will be a really large market for a highly priced fuel, and low-temperature carbonization cannot therefore be regarded as a possible major source of home oil supply. On the other hand, Labor's Plan for Oil from Coal stresses the fact that the widespread use of low-temperature coke would mitigate the smoke nuisance and make available appreciable quantities of oil and motor spirit.

Sir David Rivett made a thorough economic and technical survey of hydrogenation and hydrocarbon synthesis. He concluded that in order to make it possible to establish an oil-from-coal industry in Australia, a subsidy amounting to at least 8d. per gallon would be necessary, and for economic reasons he was therefore unable to recommend either process. He gave the following estimates (Australian currency) for the two processes.

	Hydrogenation		Synthesis
	Black Coal	Brown Coal	
Annual output of petrol, tonnes	150,000	150,000	30,000
Capital Cost, £A	11,021,000	11,940,000	2,928,750
Operating costs, d./gal. ..	8.4	8.6	6.1
3½ per cent on capital, d./gal...	2.1	2.2	2.7
Amortization :			
(i) 10 years, 2½ per cent d./gal.	5.3	5.8	7.0
(ii) 15 years, 3 per cent d./gal.	3.3	3.6	4.2
Total costs in case :			
(i) d./gal.	15.8	16.6	15.8
(ii) d./gal.	13.8	14.4	13.0

The "Falmouth" and the Labor Party Reports are agreed that the cost of producing oil from coal is high. Estimates are given in the Falmouth Report from which it appears that the cost of producing spirit by hydrogenation, after making provision for depreciation and obsolescence, amounts to 11.47d. per gallon. According to the Labor Party Report, the cost of hydrogenation and synthetic motor spirit, with a reasonable allowance for amortization and interest on capital, may be taken at 11d. and 10½d. per gallon respectively. The Falmouth Committee considered that it is useless to build on the hope that the gap between the cost of petroleum and home-produced oil will be bridged within a few years' time, and concluded that the spending of large sums of public money in building plants for the hydrogenation and Fischer-Tropsch processes is not justified. The Labor Party Report, on the other hand, took the view that the present gap between the price of imported oil and of the coal product need not be permanent; the Report does not propose that an attempt should be made to replace the bulk of Great Britain's petroleum imports by home-produced oils, but it recommends that, in the interests of the mining industry, of the national balance of payments, and of the national defence, the production of oil from coal should be fostered.

The Falmouth Committee recommended the continuance of a guaranteed preference on home-produced motor spirit for a period of 12 years from 1938, the rate being increased from 4d. to 8d. per gallon, subject to certain restrictions to safeguard the Exchequer against the undue loss of revenue, and that the guarantee should be extended to include diesel oil for use in motor vehicles. The Government accepted the recommendations and incorporated them in the Finance Act, 1938.

Oil in 1938

The world's oil output last year, while failing to create its usual annual record over its predecessor, fell less than five per cent below it, with an estimated total of 1,983,090,000 bbls. of crude as compared with 2,046,543,000 bbls. in 1937. Relatively oil did far better than any of the other industrial branches of the mineral industry, and like them the decline was due to a falling off in the United States which a small increase in other countries was insufficient to offset. The decline in the United States amounted to 63,238,000 bbls. whereas the rest of the world improved by 11,787,000 bbls. However, whether we look at the world or the United States alone production exceeded that of any year except 1937.

Estimating production from the different main sources of crude oil;—the United States total was 1,200,883,000 bbls. (—63,234,000) Russia which came second in the world's order had by far the largest increase in production; her total was 217,535,000 bbls. (+11,000,000). Venezuela which came third also improved her position, the production being returned at 187,369,000 bbls. (+1,670,000). Iran which again ran fourth totalled 77,036,000 bbls. (—1,000,000). The Netherlands Indies, fifth in order, produced 60,165,000 bbls. (+1,500,000). Rumania again fell off, though not so seriously as in 1937; her output is returned at 48,800,000 (—4,500,000). Troubles in Mexico reduced her output to about the 1936 figures with a total of 40,500,000 bbls. (—5,500,000). Iraq came next with a total of 33,192,000 bbls. (+2,000,000). Colombia followed with 21,306,000 bbls. (+1,000,000). Trinidad again showed a big improvement totalling 17,750,000 bbls. (+2,500,000). Argentina was close up with 16,900,000 bbls. (+500,000). Peru, however, dropped below Argentina with a total of 16,045,000 bbls. (—2,000,000). India returned 9,648,000 bbls. (—750,000). Bahrein continued to improve and yielded 8,297,000 bbls. (+600,000 000). Canada had by far the largest increase of all countries save

Russia, her output rising to 7,450,000 bbls. (+4,500,000). Germany went ahead of Poland with a total of 4,215,000 bbls., a gain of a little over 1,000,000 bbls. Poland improved slightly to 3,790,000 bbls. and Japan gained rather over 1,000,000 bbls. at 2,614,000 bbls. The production of Ecuador was 2,245,000 bbls. and of Egypt 1,500,000 bbls. Other productions were quite unimportant.

Although prices of crude were pretty well maintained in the United States, those of refined products softened considerably with the result that refiners generally experienced a very poor year and stocks both of motor spirit and of fuel oil were unsatisfactorily large at the end of the year, indicating that unless industrial conditions improve quickly further weakening may be experienced. The price of crude in the mid-Continent field averaged $1.19 per bbl. as compared with $1.21 in the previous year but was better than any year subsequent to 1930. In California there was no change but for the smaller Pennsylvania field there was a drop from $2.64 to $1.89. The average City price for gasoline without allowance for taxes was 13.91, or as nearly as possible ½c. per gallon below that of the previous year. At the end of the year the price was down to the December level of 1934. One factor which assisted the gasoline trade was the increase in exports. For the first eleven months these amounted to 42.607 million bbls., an advance of 25½ per cent. Fuel oil exports were 25.970 million bbls., a drop of nearly four per cent; kerosene made 6.478 million bbls., a fall of 19 per cent Curiously enough lubricants were some 12 per cent down at 8.818 million bbls. Exports of crude were 16½ per cent better at 72.388 million bbls.

While U.S. stocks of crude declined at the end of the year to approximately 271,000,000 bbls., the lowest since 1922, the proven reserves were estimated at 14,015,092,297 bbls. against 13,489,457,944 bbls., a gain of approximately 525,000,000 bbls., or not very far short of the increase recorded in 1937. It has been increasingly recognized that the above ground stocks have little importance in these days of steadily increasing proved reserves, which despite the enormous consumption of oil in the States are larger every time a fresh survey is made. The number of wells completed were 27,149 as compared with 32,560 in the previous year but with that exception were the largest in the history of the industry.

One of the features of the year was the failure of existing powers for regulating production to prevent large accumulations of refinery products with their consequent effect on price structure. Texas, in particular, was restive at having to hold the umbrella over some of the new producers where an effective State law for regulating output does not exist, and on several occasions suspended the week-end holiday by which alone its production is kept within bounds. An enormous crop of Bills have been introduced in the Federal and State legislatures for the purpose of tightening up Restriction, and there is a growing impression that without Federal control effective regulation may prove impossible. It will probably depend on how far consumption improves in the next few months whether this becomes a prominent issue in the present Congress.

The Outlook for Japan's Heavy Industry

(By The Tokyo Correspondent of The Mining Journal)

Out of every hundred yen which Japanese investors sank into new business during the first half of 1938, Y21.80 went into the mining industry, Y14.40 into the machinery industry, Y0.30 into the shipbuilding industry and Y25.80 into the chemical industry. Out of a total business promotion (new establishments, capital increases and debenture issues) valued at Y2,031 million in these six months, Y1,575 million or 77.4 per cent were heavy industrial and chemical investments. Though the absolute volume of new investments has somewhat shrunk in recent months, the relative share of heavy industrial business promotion has increased, as intensified investment control has completely shut off the light industries from the usual influx of fresh funds.

How has this tremendous injection of capital worked in the heavy industry?

The last official figures relating to the output of Japan's blast furnaces and steel mills are for 1936. Though they are obsolete, they are quoted to show where the industry started when the Sino-Japanese war broke out a year and a half ago and high-pressured iron and steel plants into larger volume.

Pig Iron

(In thousands of m. tons)

	Production	*Imports from Colonies*	*Other imports incl. Manchoukuo*	*Imports from Manchoukuo only*
1934 ..	1,728.2	164.2	614.4	409.4
1935 ..	1,906.8	130.6	961.9	382.7
1936 ..	2,007.6	122.9	972.0	271.2
Steel Products:				
1934 ..	3,322.7	56.1	370.6	Negligible
1935 ..	3,976.1	41.3	315.9	,,
1936 ..	4,538.6	48.9	296.1	,,

Japan's pig iron production in 1936 was but seventh in world ranking, with the combined output of Japan, Korea and Manchuria still a little below Belgium, the world's sixth largest producer in that year. In the production of steel (ingots and castings) Japan ranked sixth after the U.S.A., Germany, Soviet Russia, England and France. Pig iron production was approximately one-fifteenth that of the United States, and steel output one-tenth.

Less than 20 per cent of the iron ore from which the pig iron was produced came from Japanese or Korean mines; more than 80 per cent were imported. Moreover, almost all blast furnace coke was produced from imported coal, though blended with a certain amount of inferior Japanese coal.

The coking-coal situation contains an important clue to the present position of the pig-iron operations. Imports of this essential base material for iron production are known to have decreased rather than increased, owing to the destruction of Chinese collieries on which the Japanese iron industry depends. The supply is at present derived from two foreign sources; the British-operated Kailan Mining Administration at Kaiping, North China, and the French Indo-China Coal Syndicate. These interests, especially the British mining firm, have made great efforts to cope with the Japanese demand, but their combined supply together with that of some hastily repaired Chinese mines, averages only 300,000 tons a month, whereas Japanese imports in 1937 ran as high as 370,000 tons each month.

Attempts were made to blend the imported product with a larger proportion of domestic coal than usual, but blast furnace operations were slowed down, and even rumors of total breakdowns were occasionally heard.

Aside from these difficulties, it is generally believed that the construction of new blast furnaces has made unsatisfactory progress, and it is one of the few open secrets in Japan that strong official pressure has been brought to bear upon cement manufacturers in prompting their recent decision to use a part of their rotary kilns for the production of pig iron so as to supplement the existing blast furnace capacity.

Steel foundry operations in Japan have always been characterized by an absurdly liberal use of imported scrap in the hearth. Many mills use up to 70 per cent of scrap in the charge, though government-operated steel works have restricted the proportion of scrap to 30 per cent. The amount of scrap imported in past years occasionally reached as much as two million tons, but has not touched this mark in 1938 as American scrap has become scarce with the recovery of U.S. steel mill operations. There was some importation of scrap iron from China, which became available through the destruction of factories, railroads and bridges, but nevertheless the shortage has become so acute that every used tin can, every pin and nail is recovered by government order to add to the scant supplies. While liberal use of scrap tends to abridge operating hours and increase output per hour, a shortage of scrap must necessarily have the opposite effect, and though the total hearth capacity has been increased during the past two years, actual output is not substantially higher than in 1936 and 1937.

Japan has ceased to publish detailed import statistics, but imports under the heading "Ores and Metals" increased from Y375 million in 1936 to Y901 million in 1937 and reached Y520 million up to the end of October, 1938. These figures include non-ferrous ores and metals.

By and large, then, the supply of pig iron and steel depends either directly or indirectly on imports, indirect imports being ores and scrap metals, while direct imports comprise pig iron (Y42.1 million in 1936), sheet bars (Y10.1 million), iron ingots, blooms, billets and slabs (Y5.3 million), shaped iron (Y4.1 million), rails (Y2.9 million), wire rods (Y4.6 million), iron plates (Y3.6 million), tinned iron and steel sheets (Y14.2 million), pipes and tubes (Y6.8 million), special steels (Y7.1 million).

Since the outbreak of the Sino-Japanese hostilities the trend has been towards heavier buying of semi-finished iron and steel products and particularly special steels, while imports of steel materials in more advanced mechanical processing phases, such as galvanized steel sheets, wire rods and steel tubing are gradually declining, as Japan has developed an iron and steel processing industry of its own which will be one of the lasting gains of the current economic emergency.

Two years ago Japan had not a single rolling mill for the production of large-sized cold-rolled steel sheets. Now the Japan Iron Manufacturing Co. is operating one that has only three rivals in the world; two in the United States and one in Germany. While a considerable amount of rails was imported as late as 1936. Japanese manufacturers have already export ideas. The same situation obtains in the steel tubing industry. Japan has the world's largest wire-rope manufactory, according to the Tokyo representative of the Bethlehem Steel Corporation, who has been selling the wire rods. But soon Japanese mills will not only be producing the wire for the ropes but the rods for the wire as well, importing the lower-priced slabs.

On the other hand, it is not generally realized that Japan still imports almost all armor plate for its battleships and tanks and even the ordinary carbon steel plate that goes into the construction of oil storage tanks.

Where really marked strides have been made, is in the mechanical industries which turn iron and steel into all kinds of moving machinery.

The value of production in 1932 was Y543.8 million, against imports in the amount of Y96.6 million. In 1936 the output represented a value of Y1,449.4 million, with imports increased to Y153.1 million. The recent development is especially notable in the manufacture of electrical motors, boilers and internal combustion engines, automobiles, aircraft and machine tools. The value of machine-tool production in 1934 was but Y23.5 million; in 1936 the output was valued at Y36.5 million.

The automobile, machine-tool and aircraft industries have since been made the subject of special encouragement. Under three almost identical sets of legislation manufacturers qualifying for a government licence were granted exemption from business profit taxes and import duty on plant equipment. In the automobile industry, where these principles were first applied, the results are already conspicuous. In 1937, 14,430 cars rolled off the production line (exclusive of those assembled in Japan from imported parts), and current production capacity is believed to be little short of 50,000, which compares favorably with such an old-timer in motordom as Italy.

Though a settlement of the Sino-Japanese hostilities which would allow Japan to consolidate its gain seems still a long way off, Japan is already talking about "long-term construction" in China.

Monopolistic "development" companies have been organized in North and Central China, whose numerous subsidiaries are to take charge of the reconstruction of the war-torn areas, of the repairing of mines and factories, bridges and railroads and of the construction of coal-liquefaction and electro-chemical plants, hydro-electric power stations, blast furnaces and steel mills. Other subsidiaries are to extend the existing long-distance bus and truck services, others to build up the telecommunication system in North and Central China.

Will the Japanese heavy industry be able to produce materials and machinery for the reconstruction works on the continent and the demand that will arise with the projected industrialization of China?

This may prove a financial rather than industrial problem. It has been shown that every ingot of steel that goes into further processing is imported either as it is or in form of scrap and pig iron and iron ore, and though Japan may be able to obtain some Chinese ore and pig iron as the wrecked mines and blast furnaces are restored and expanded, the strain on the gold and currency reserves, depleted through the costly war, would still remain a formidable problem.

Many of Japan's own industrial plants have been worn down by the grind of ceaseless emergency operation and require re-tooling and replacement, and as the domestic capacity for basic machine tools is still insignificant, the industry will be faced with the alternative of importing new equipment (if it can), or sliding back to lower production levels, while any marginal capacity that should be left once normal conditions are restored is likely to be absorbed by urgent civil engineering and construction projects in Japan which have been put off since the outbreak of the hostilities, while others of great strategical significance have been added since.

However, these difficulties are not likely to affect all manufacturing lines to the same degree. Japan will no doubt be able to ship to the continent a great number of motor vehicles and locomotives, small stationary engines and electric motors and also all kinds of textile machines and thus to make valuable contributions to the motorization—and in a limited sphere—industrialization of China. Possibly, but not very likely, Japan will be able to spare some light mining machinery and chemical plant.

All factors considered, the outlook is bleakest for heavy mining equipment and metallurgical plant, large chemical reaction vessels, steel mills and materials for the ambitious civil-engineering projects.

Showa Plans Vast Expansion

The fifth and sixth stage expansion programs of the Showa Steel Works, entailing a total expenditure of Y622,240,000, whereby pig iron production would be increased by another 1,360,000 metric tons to bring the total productive capacity of the mills to 3,060,000 tons were outlined by directors of the Steel Works to executives of the South Manchuria Railway Company, recently. The above two programs, running concurrently, should get under way this year and are scheduled to be completed in 1942.

Besides boosting the pig iron output to 3,060,000 tons from the present capacity of 1,700,000 tons, the new plans provide for increasing the production of luppe by 40,000 tons, in addition to the 200,000-ton output called for under the third and fourth stage programs, the portion of these programs concerning luppe was originally scheduled for completion last year, but has been carried over to the present year, owing to unavoidable delays. Upon consummation of the fifth and sixth stage programs in 1942 luppe output will be augmented to 240,000 tons.

The production of steel ingots by the end of 1942 would also be raised by 1,750,000 tons. This should bring total production to 2,830,000 tons, inclusive of the present productive capacity of 580,000 tons, and the output of 500,000 tons provided under the third and fourth stage plans. Completion of that part of the plans relating to steel ingot production has also been delayed, though its consummation was scheduled for last year.

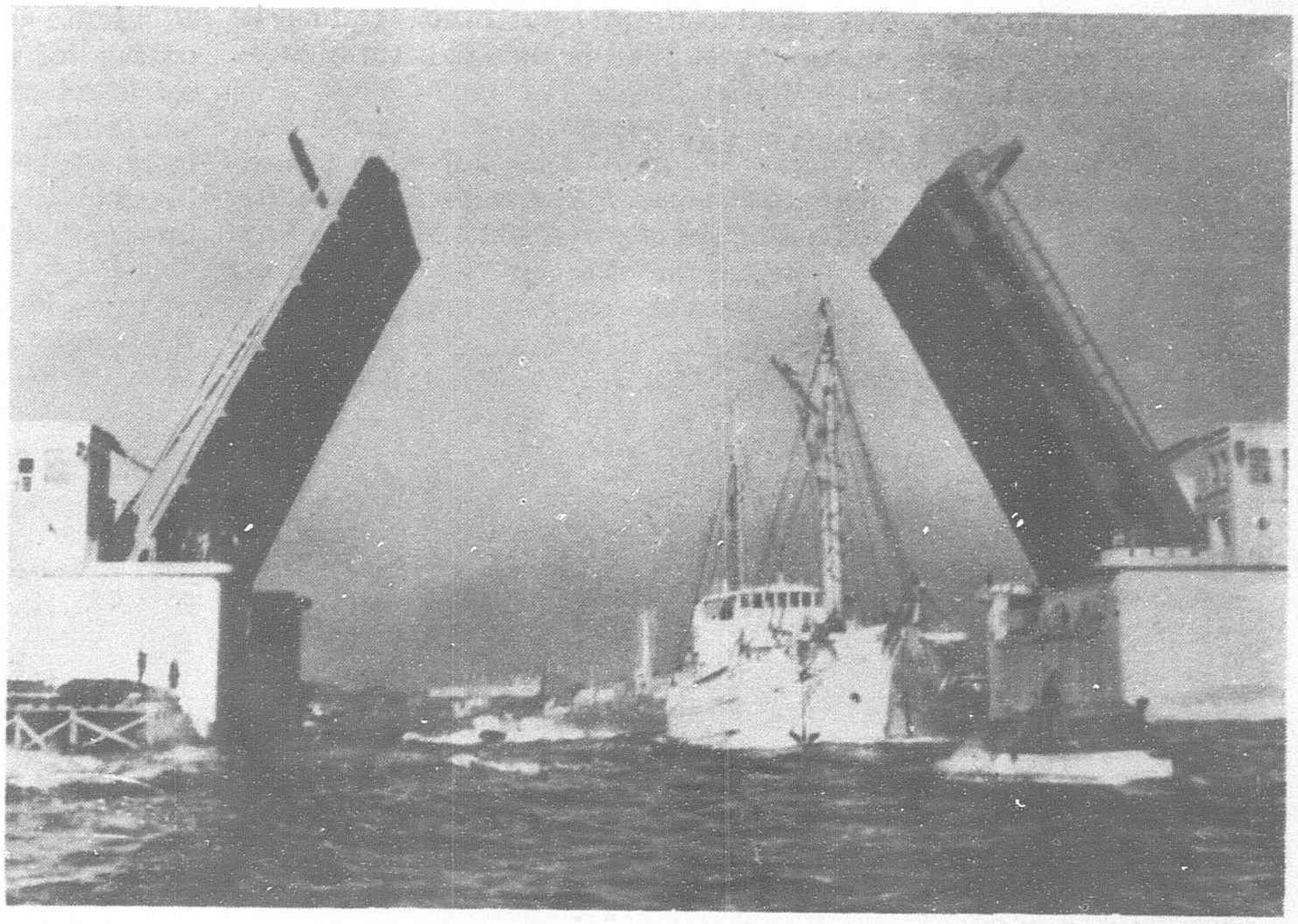
The Showa Steel Works at present is planning to obtain the huge supply of coal necessary for carrying out the fifth and sixth stage plans from the Fushun, Penhsihu and Yentai collieries. In 1939 it hopes to obtain 3,297,000 tons, in 1940, 4,620,000 tons; in 1941, 6,196,000 tons, and in 1942, 6,420,000 tons. It is held doubtful, however, whether the productive capacity of these coal mines in Manchuria will be sufficient to furnish such enormous supplies of coal. It is believed that in the final analysis some of the needed supply will have to be obtained from the Kailan Mining Administration in North China.

Bascule Bridge Over the Sumida is Notable Engineering Project

By W. HARVEY CLARKE, Jr.

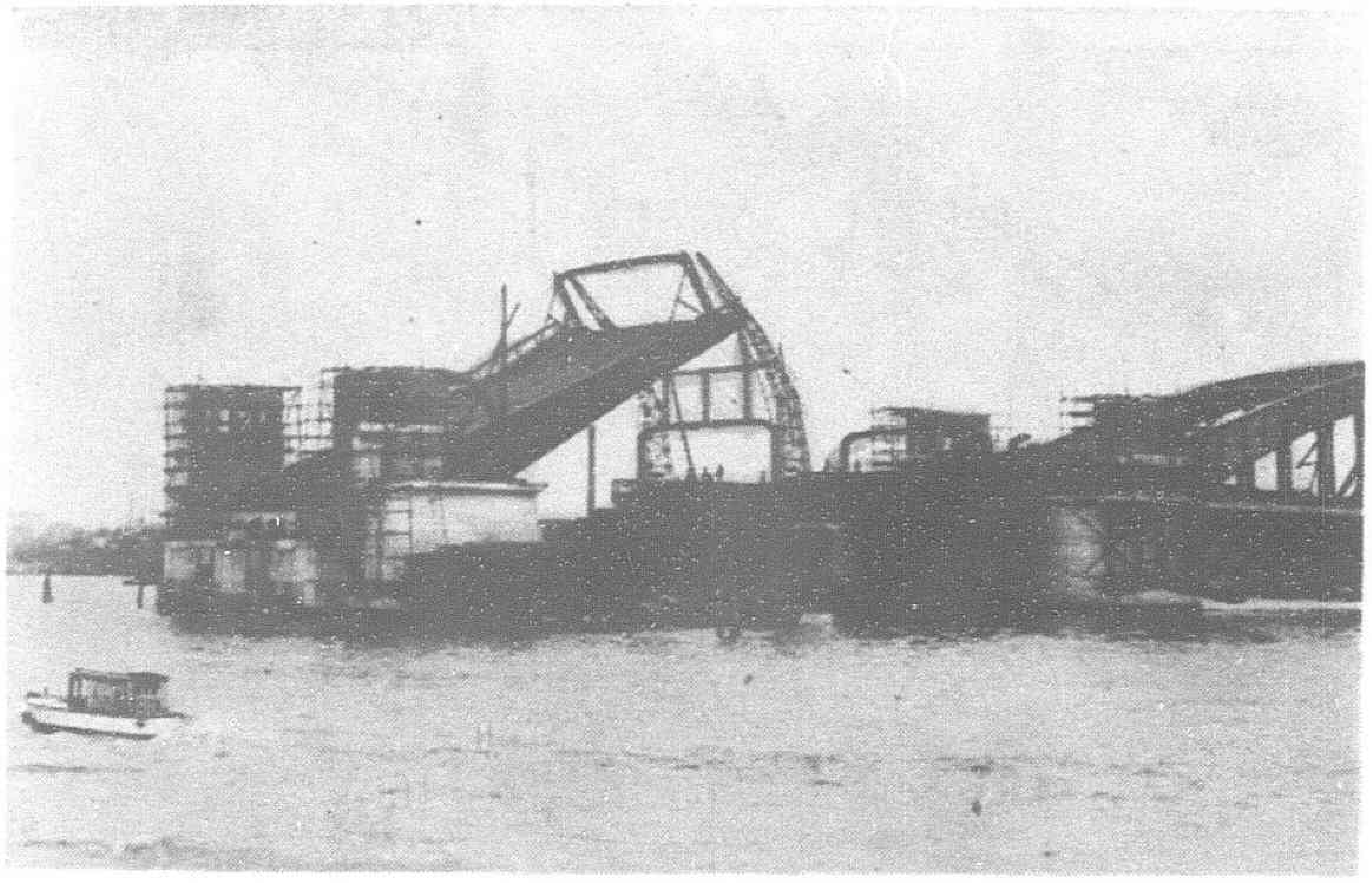
Two of three spans already constructed and the third slated to be completed by next winter, the 246 meter long Kachidoki (Victory Cry) double lever lifting-bridge, with a 25 meter overall width designed to accommodate four lanes of vehicular traffic, will link Tsukishima—a 190 acre island tract reclaimed from the upper reaches of Tokyo Harbor and the Sumida River bed—with the Tsukiji district of Kyobashi Ward in downtown Tokyo.

The aggregate cost of this triple-span structure to the municipality of Tokyo has finally been determined at about Y4,200,000, although when construction was begun more than six years ago, in May, 1933, it was estimated that the total cost of the central drawbridge section and the two fixed spans would approximate only Y2,650,000.



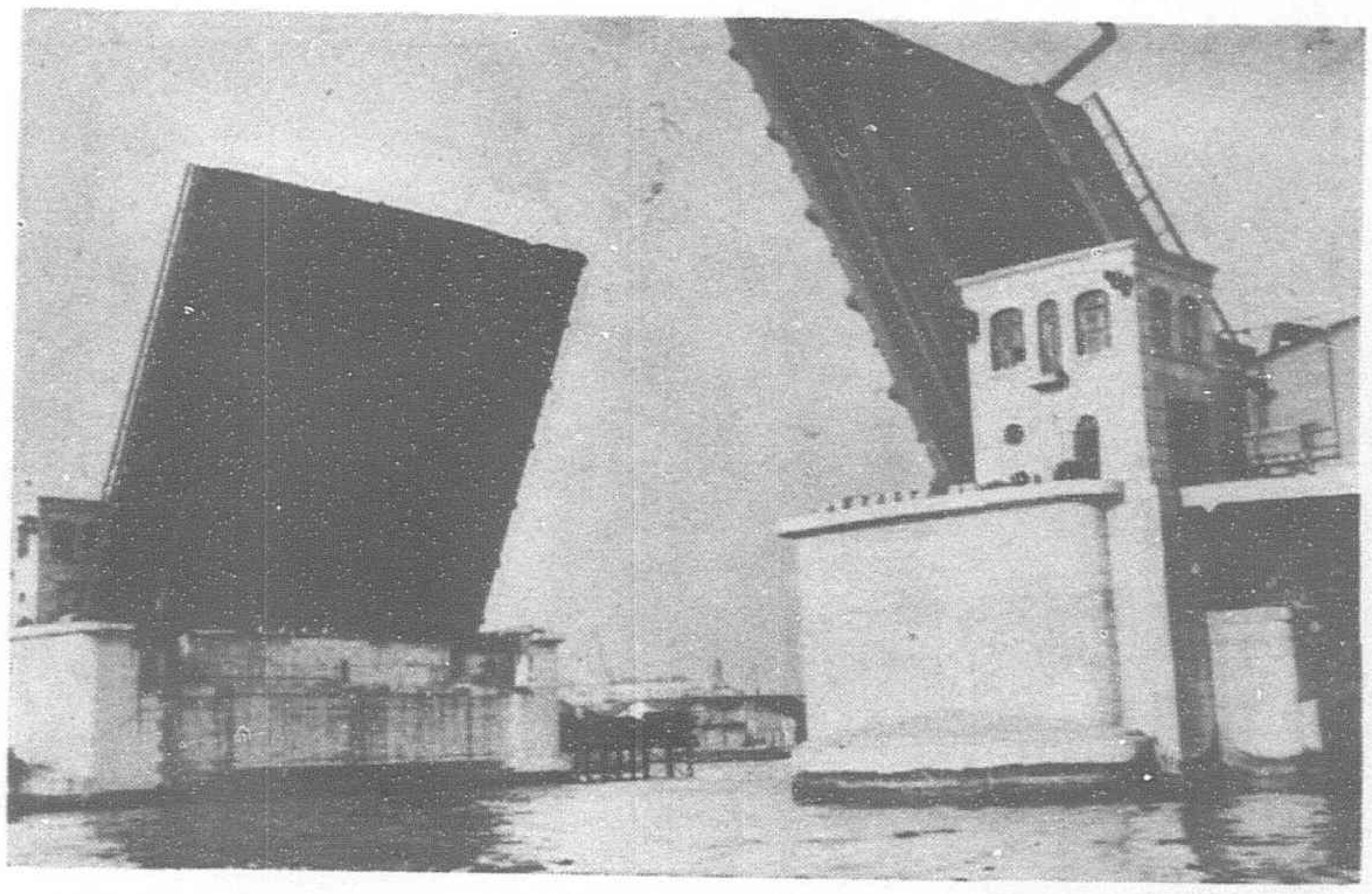
A fishing sloop about to pass through the Kachidoki drawbridge while the double leaves are uplifted to their maximum angle of 70 degrees

Into the construction of the bridge, which is the first of its type to be built in Japan, exclusively domestic products are going—from the novel automatic lock mechanism invented by Japanese engineers for the two main-beam cantilever ends of each bascule leaf even to the smallest rivet used. From a structural standpoint, supervising technician Giko Tokuzen, head of the bridge building



1

Work on two of the three spans of the Kachidoki drawbridge was finished in the spring of this year



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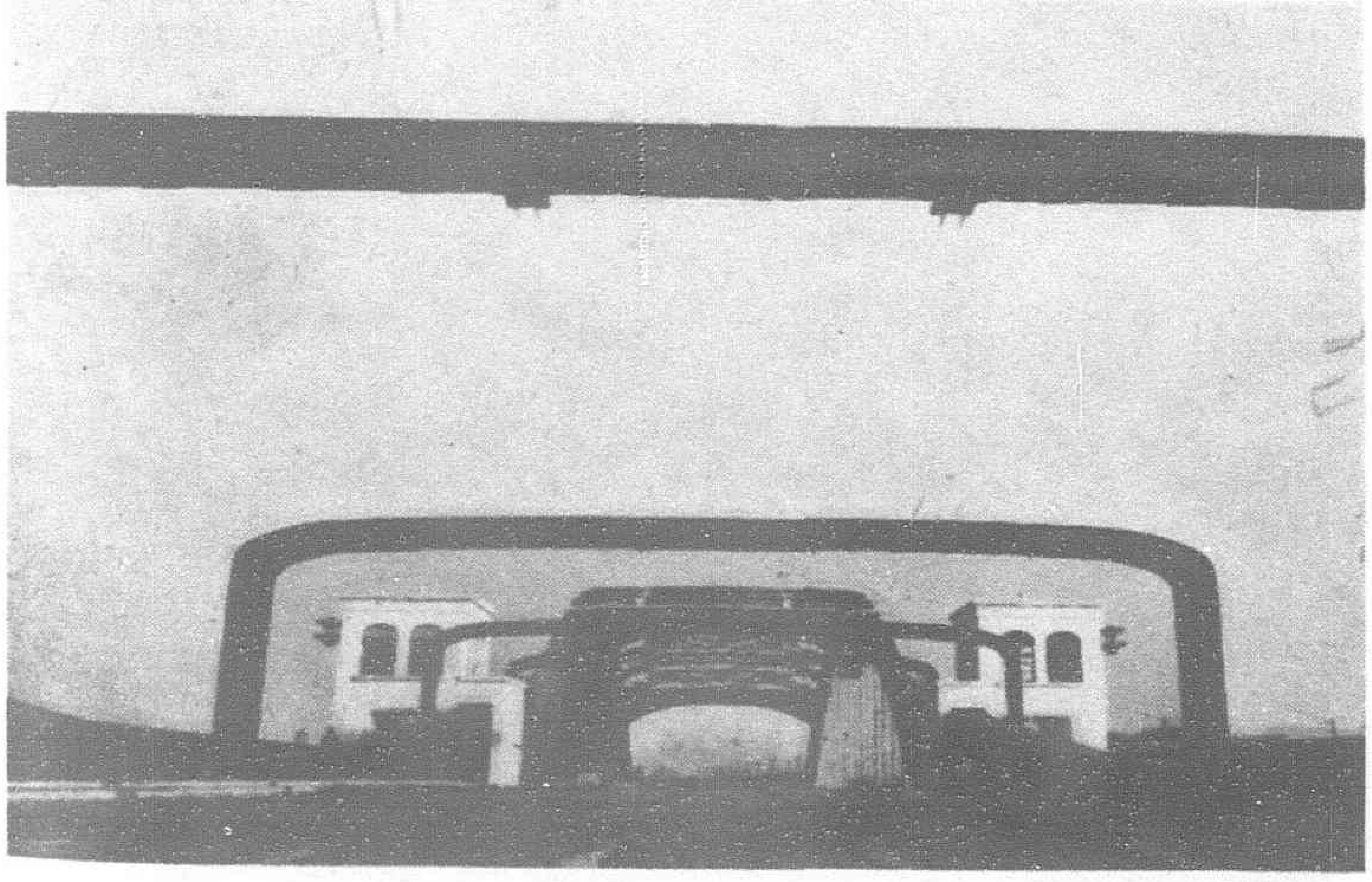
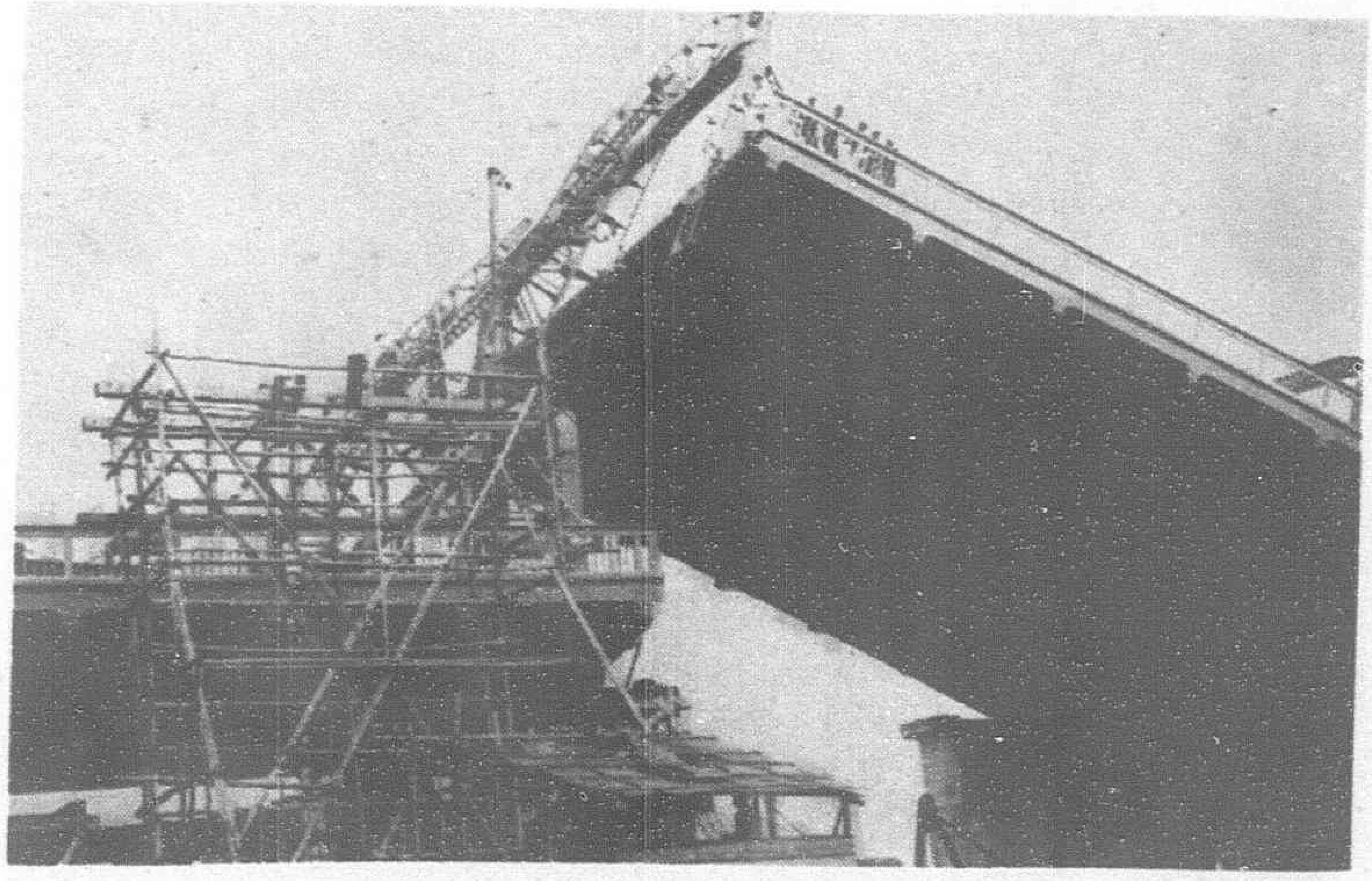
With drawbridge leaves raised high, a clear view of the tower and upper floor structure of St. Luke's International Medical Center is given rising over the distant Tsukiji roof-tops



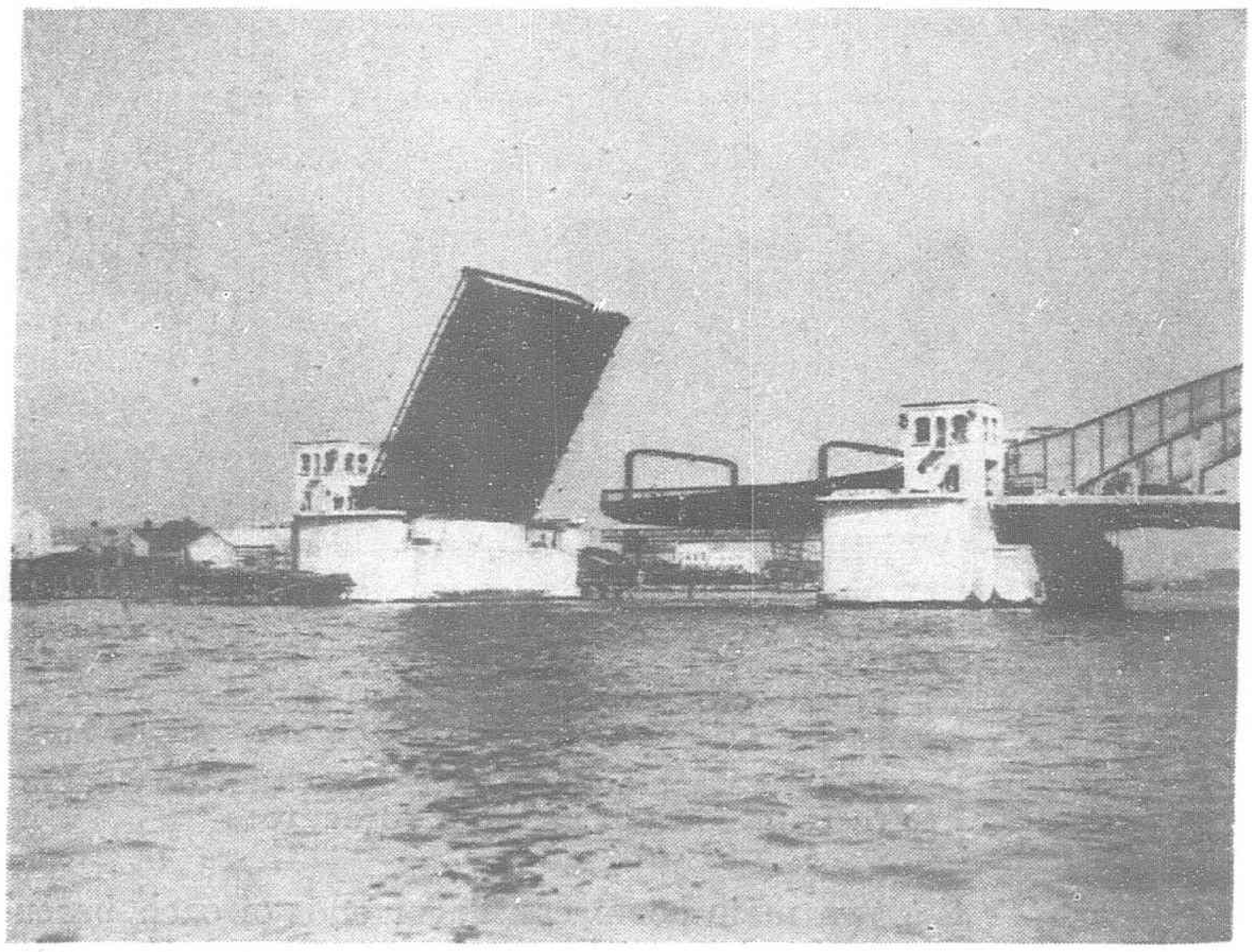
Already two-thirds completed, the Kachidoki triple-span, double lever lifting bridge is designed to accommodate four lanes of motor-car traffic and a double track trolley line across its 25-meter width



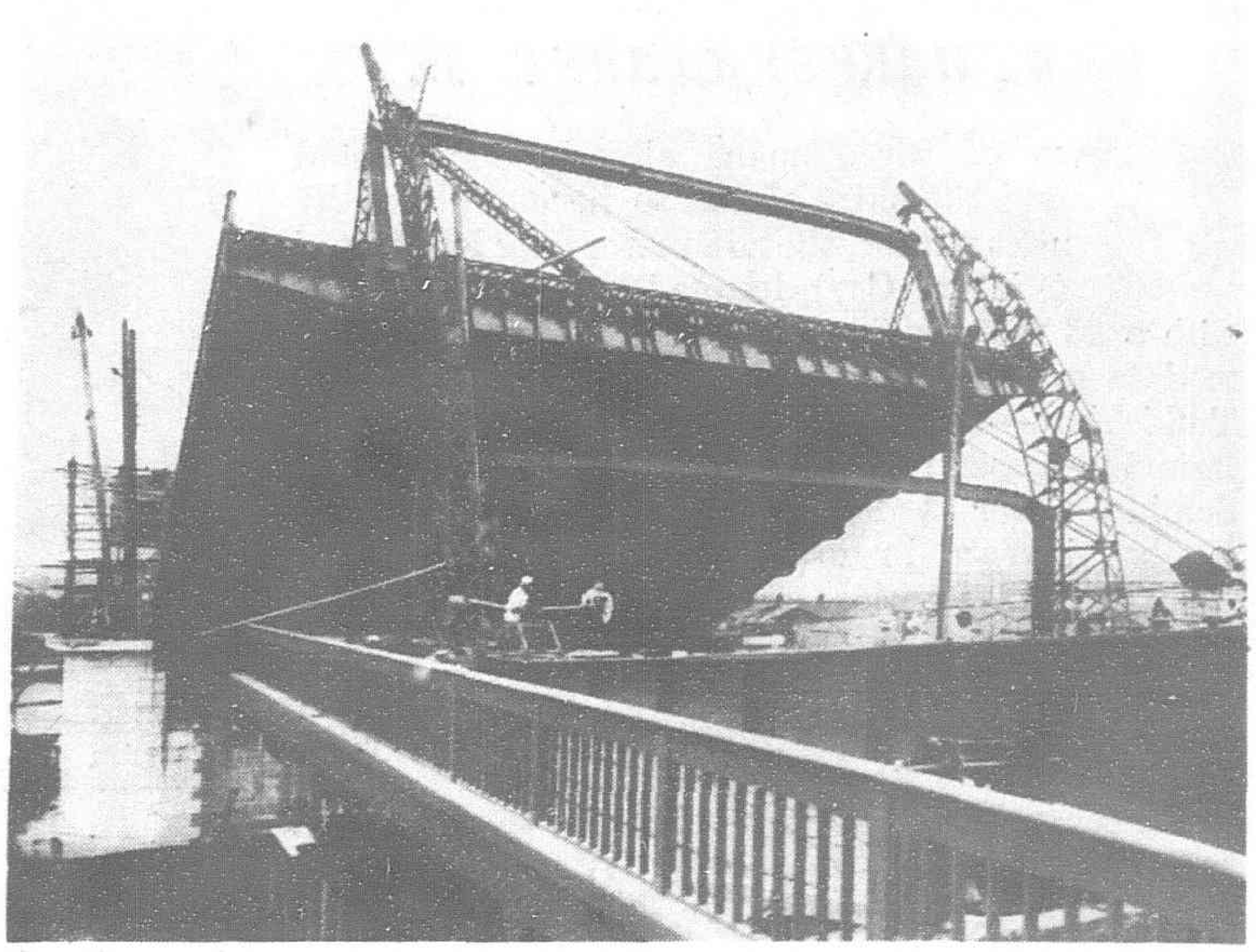
Rectangular area, 40 by 40 meters, surrounding two mid-river pile structures for the bridge was enclosed by cofferdams to permit more effective construction. Above, a friction test for trunnion shaft is being made section of the Tokyo City Engineering Department, claims it deserves signal recognition among similar bridge structures anywhere in the world.

Extensive Facilities

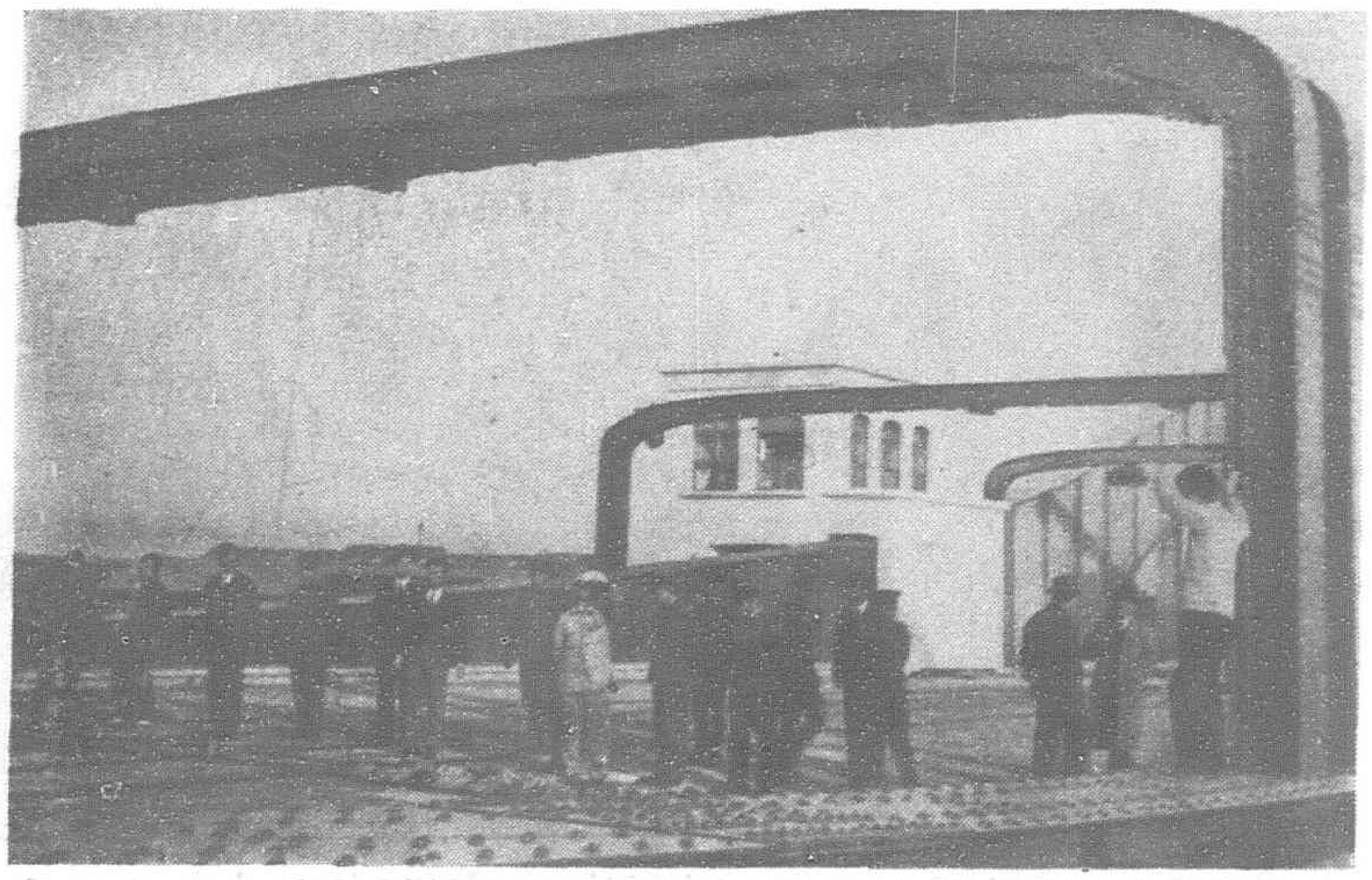
Spanning the historic Sumida some 500 meters up from its mouth, the drawbridge is situated where five times daily during 20 minute periods the two 37 meter leaves are raised to permit passage of deep-sea cargo vessels at present not exceeding three thousand tons displacement, besides numerous tugs, ferry boats and fishing craft of many descriptions that with increasing frequency in recent months are plying the city's chief water artery. When plans for deeper dredging of the ship channel are carried out in the future, the drawbridge can admit through its passway of 44 meters



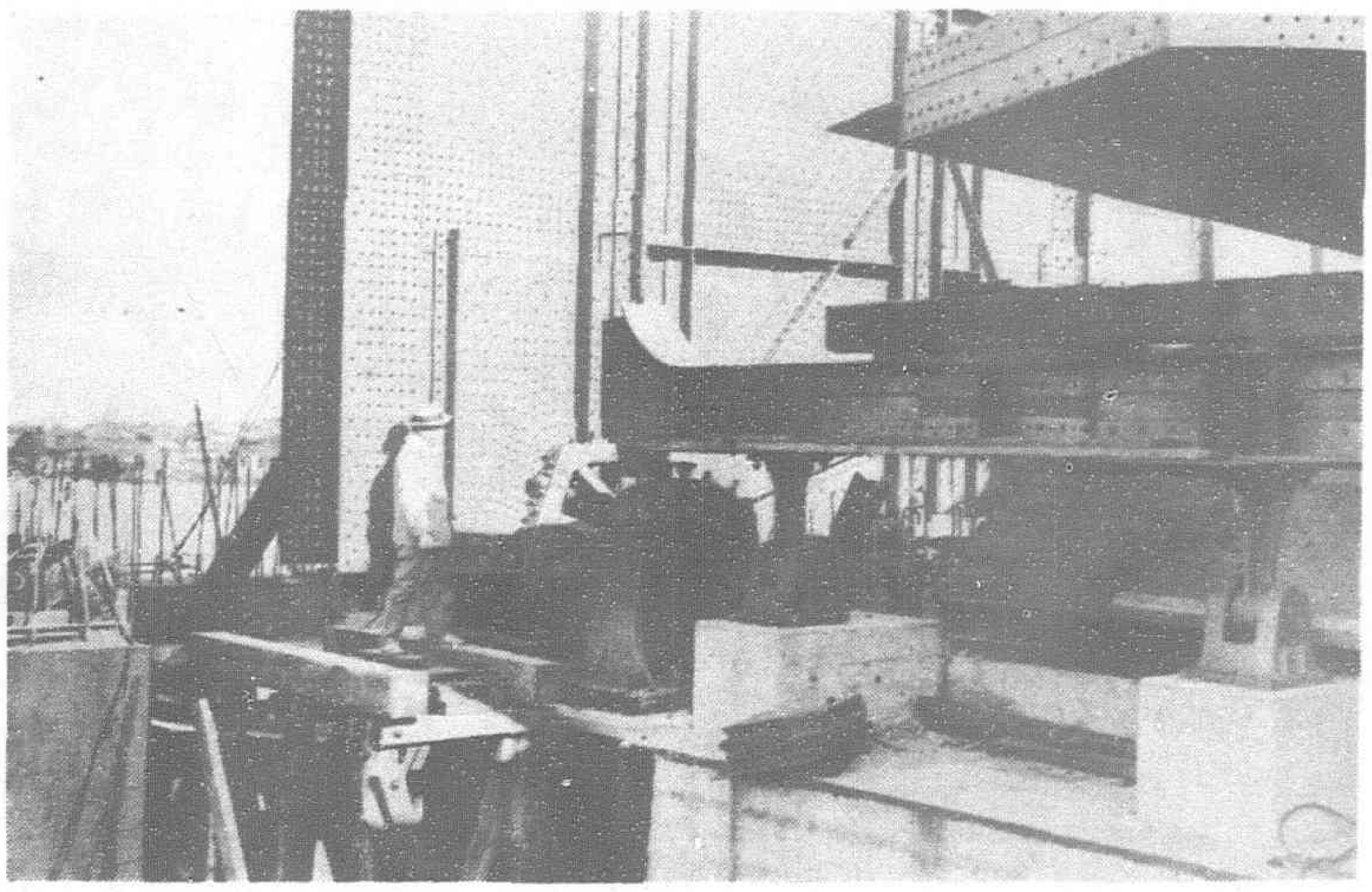
Viewing the central span with one bascule leaf raised and part of the almost finished fixed arch span connecting with the opposite Tsukishima bank as both near completion



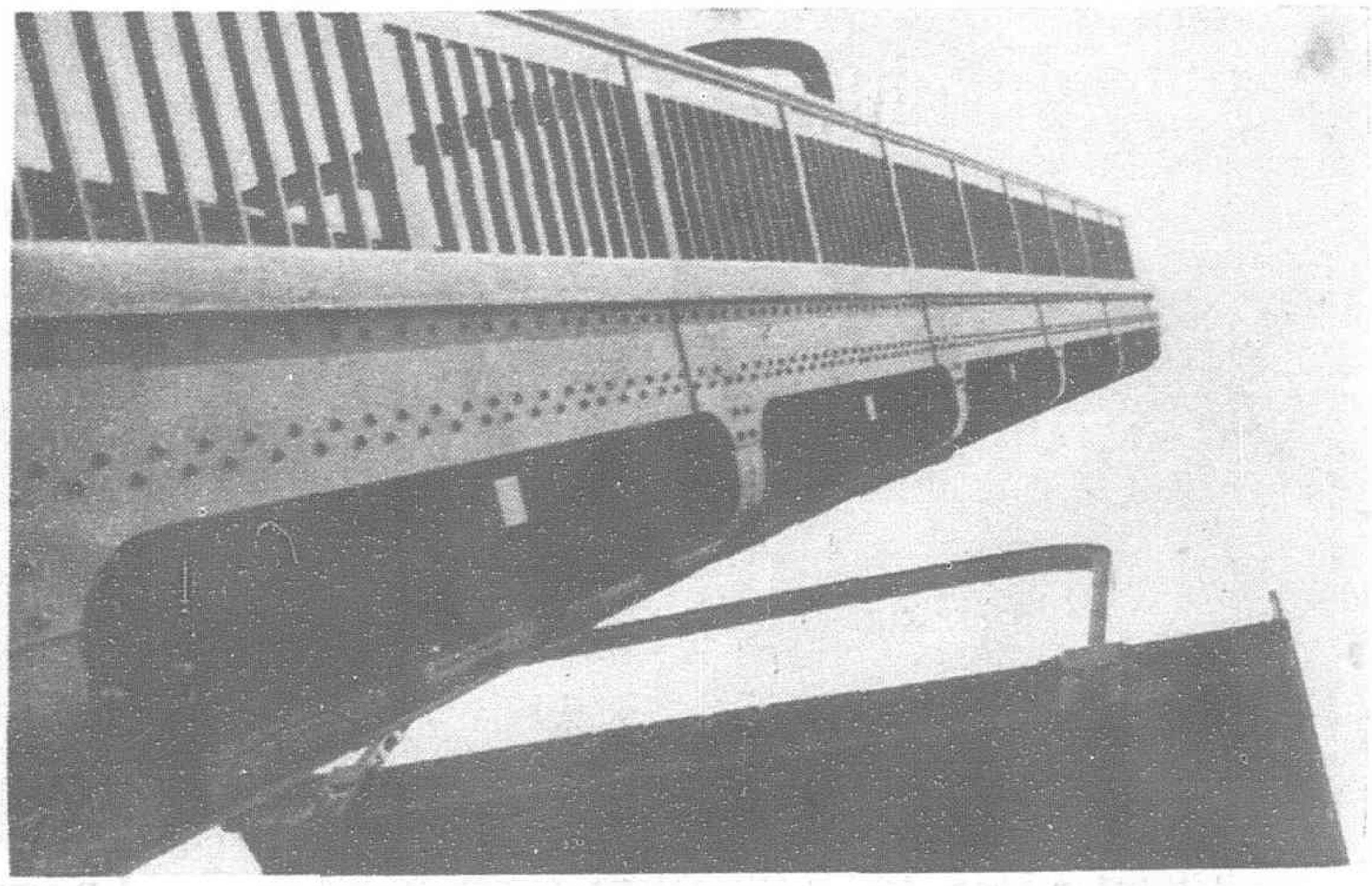
Another phase of construction progress with work on the movable central span well on way to completion



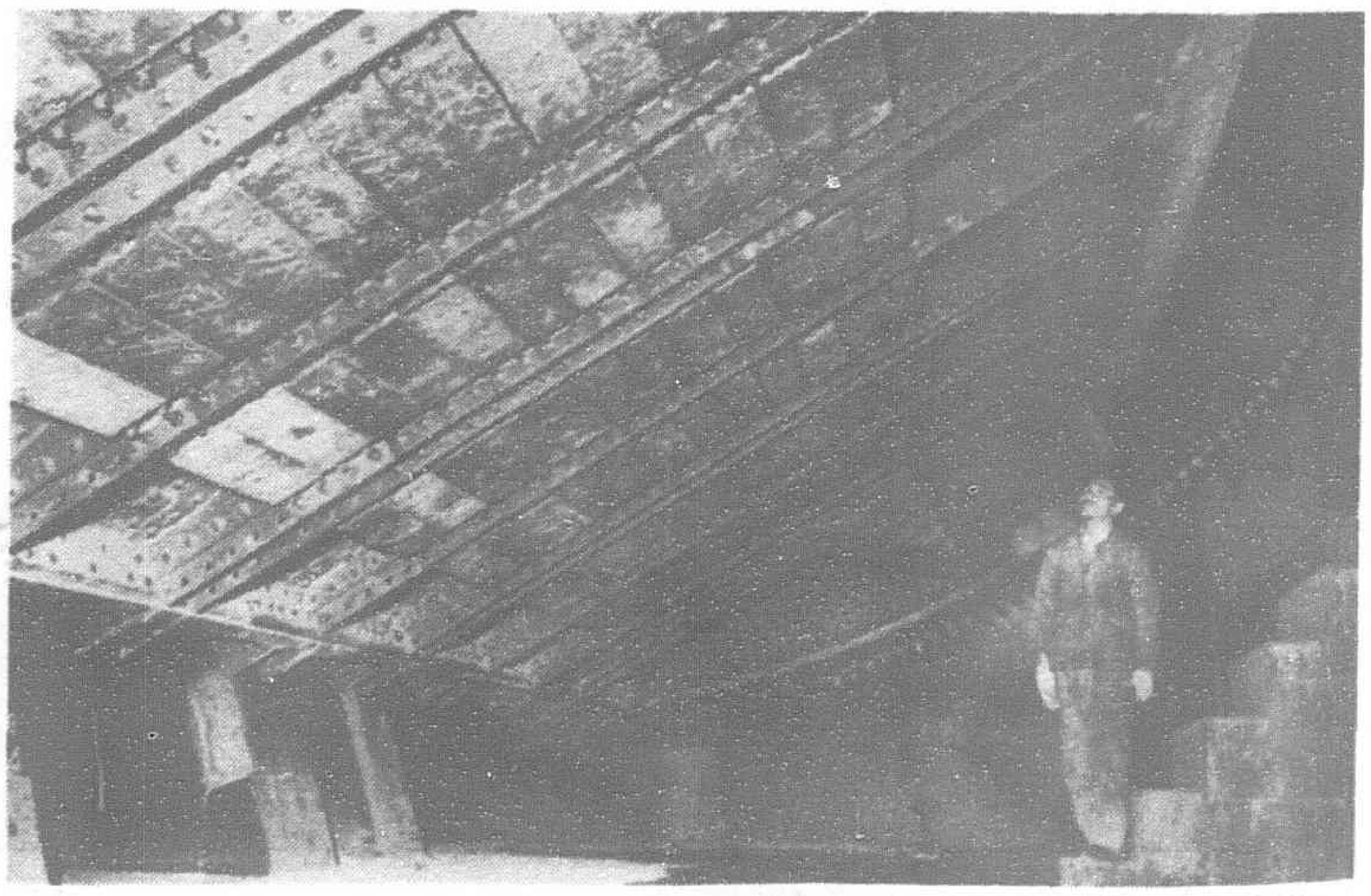
One man can operate the bascule leaves from control room in one of the four towers of the central span, such as is shown above. Wind indicators and a stop-go signal system aid in directing river traffic



Photograph taken soon after trunnion bosses, trunnion garters and pin bearings were installed on the girdered structure of one of the two leaves of the bridge



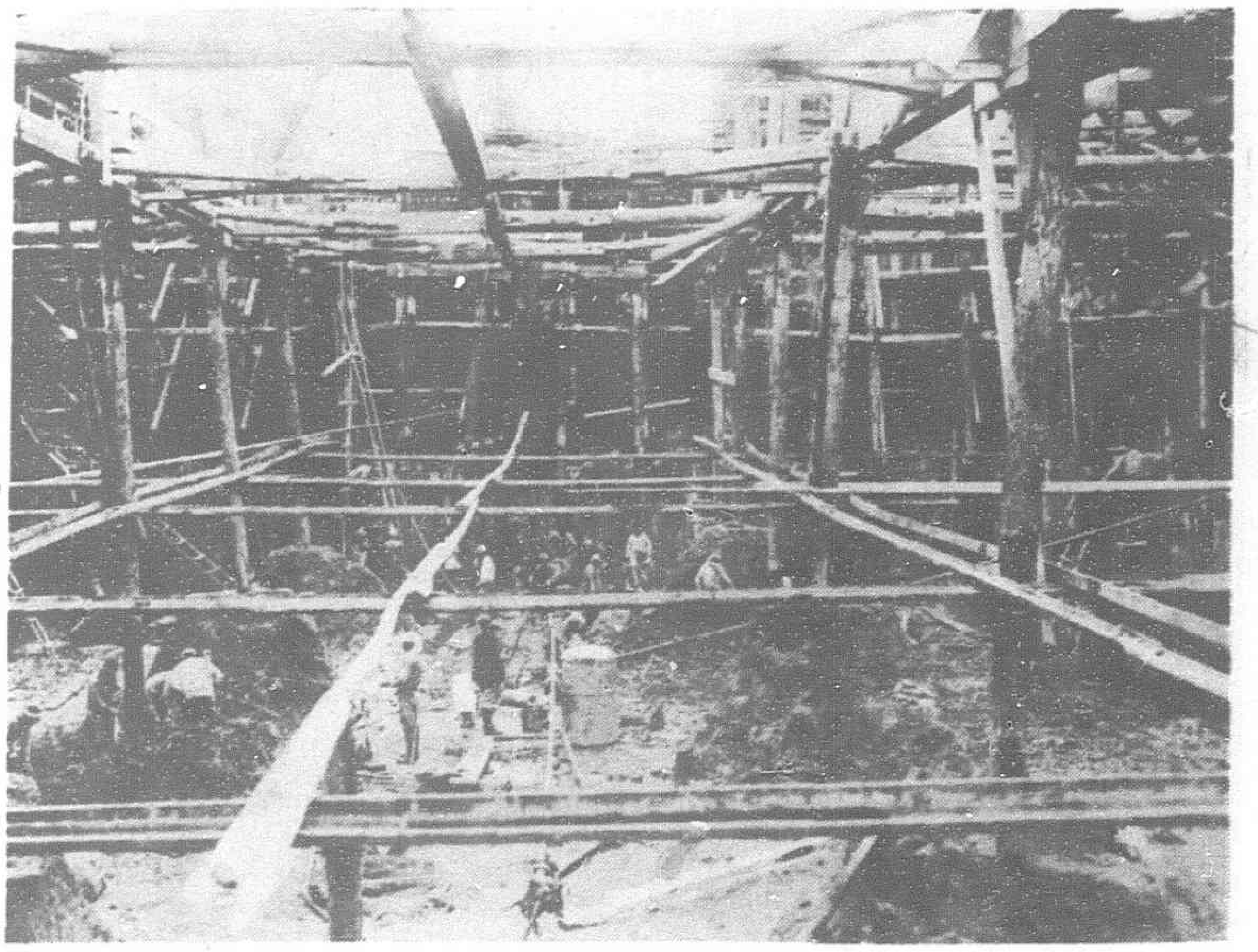
An angular close-up from below of the immense bulk of the partly raised leaves of the drawbridge. Lining the surface edge of one leaf-end a row of giant grip-teeth is visible

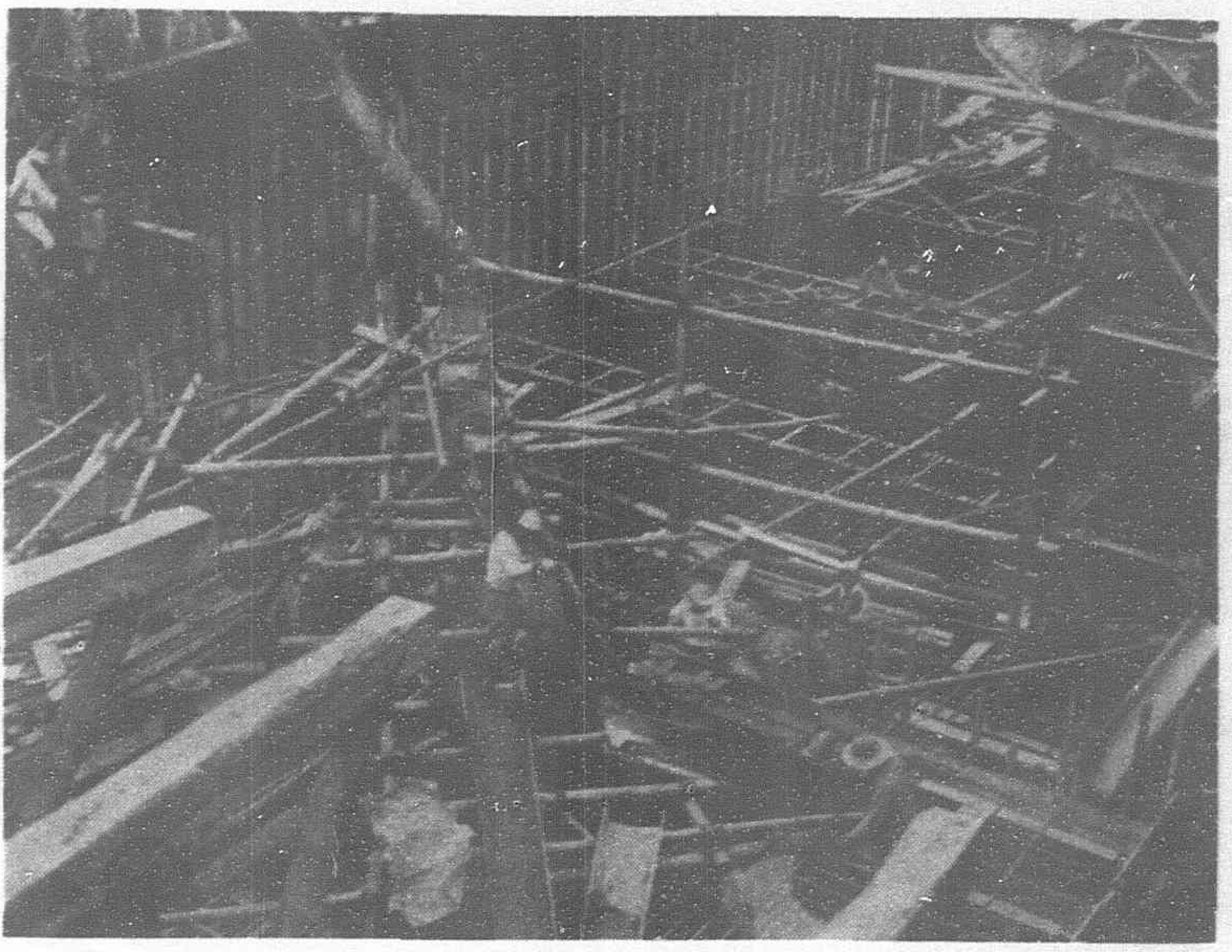


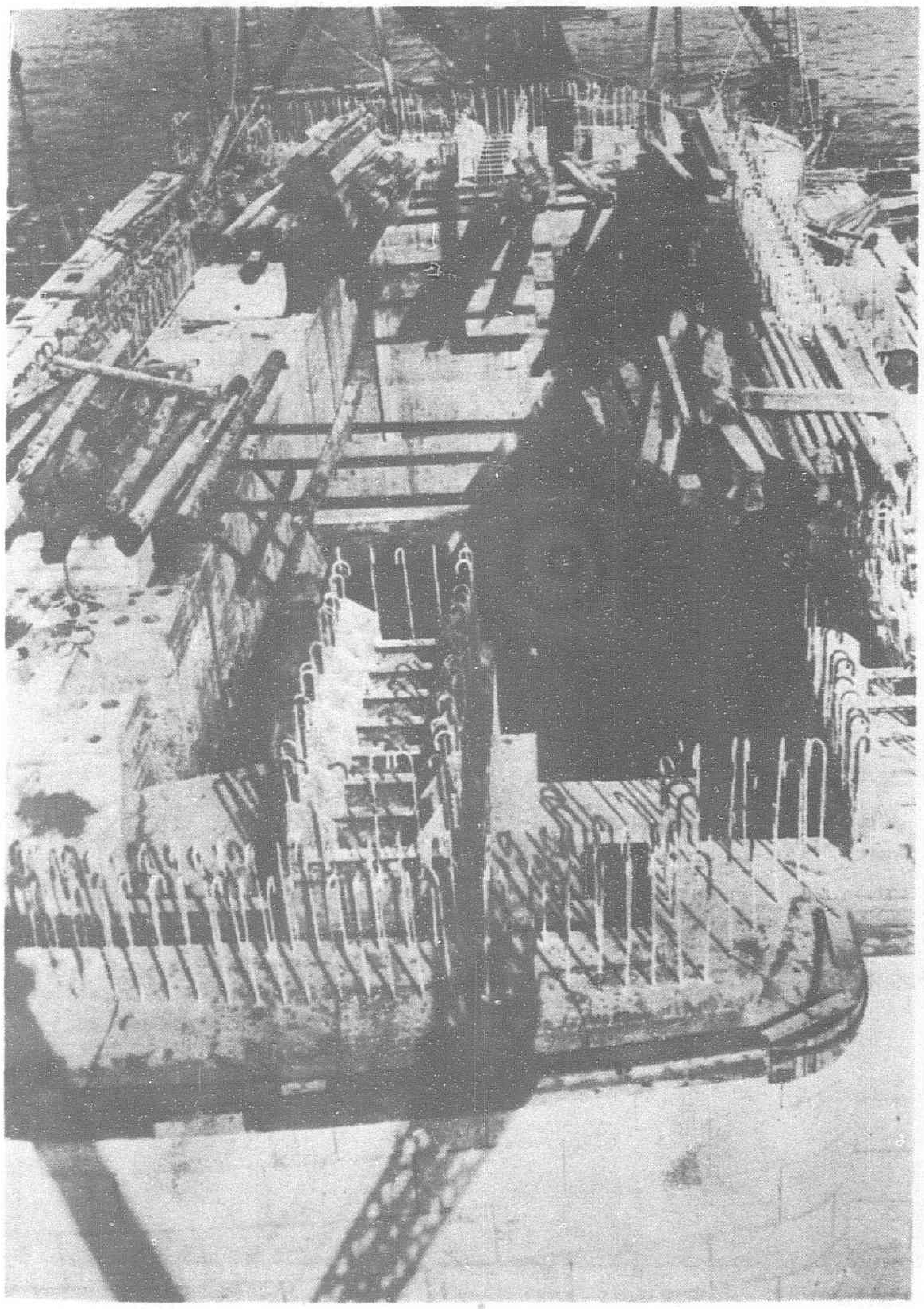
The man here is standing at base beneath one of the partially raised bascule leaves, to facilitate of lifting of which two huge geared counterweights balance the weight of each leaf between the inner faces of the two mid-river piers vessels displacing as much as ten thousand tons. This passway is slightly wider than the narrowest part of the Panama Canal and about two-thirds as wide as the Suez Canal.

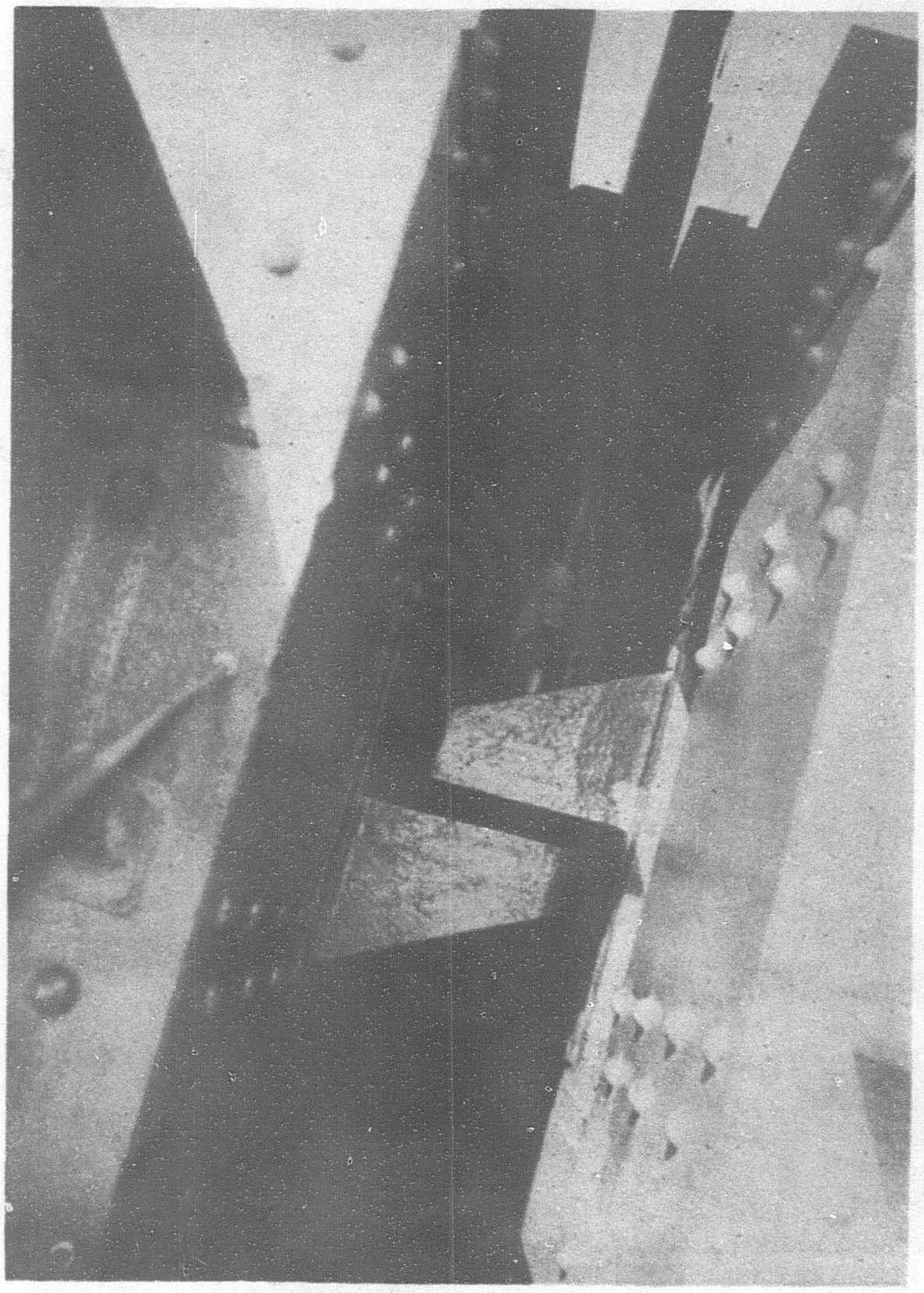
Along the nearby river banks fringing part of the upper harbor of the seldom-publicized port of Tokyo are located many important industrial plants and godowns, including the Ishikawajima Shipbuilding Yard and the warehouses of the Mitsubishi, the Toshin and the Sumitomo interests, as well as the spacious new fireproof Tsukiji Central Fish and Provision Market.

Geologic surveys revealed that the Sumida River bed at the new bridge site is composed of compact brownish sand stratum having a ground pressure under actual tests of 120 tons per square meter. For this reason, excavation with concrete filling by means of the cofferdam process to a depth of five meters below the river bed, as well as other constructional measures, was resorted to as a


A scene where excavating is in full swing in one of two mid-river pier-pits protected from water inflow by encircling cofferdams


Construction of two mid-stream piers for the bridge was accomplished by erecting cofferdams to shut out the flow of Sumida river water

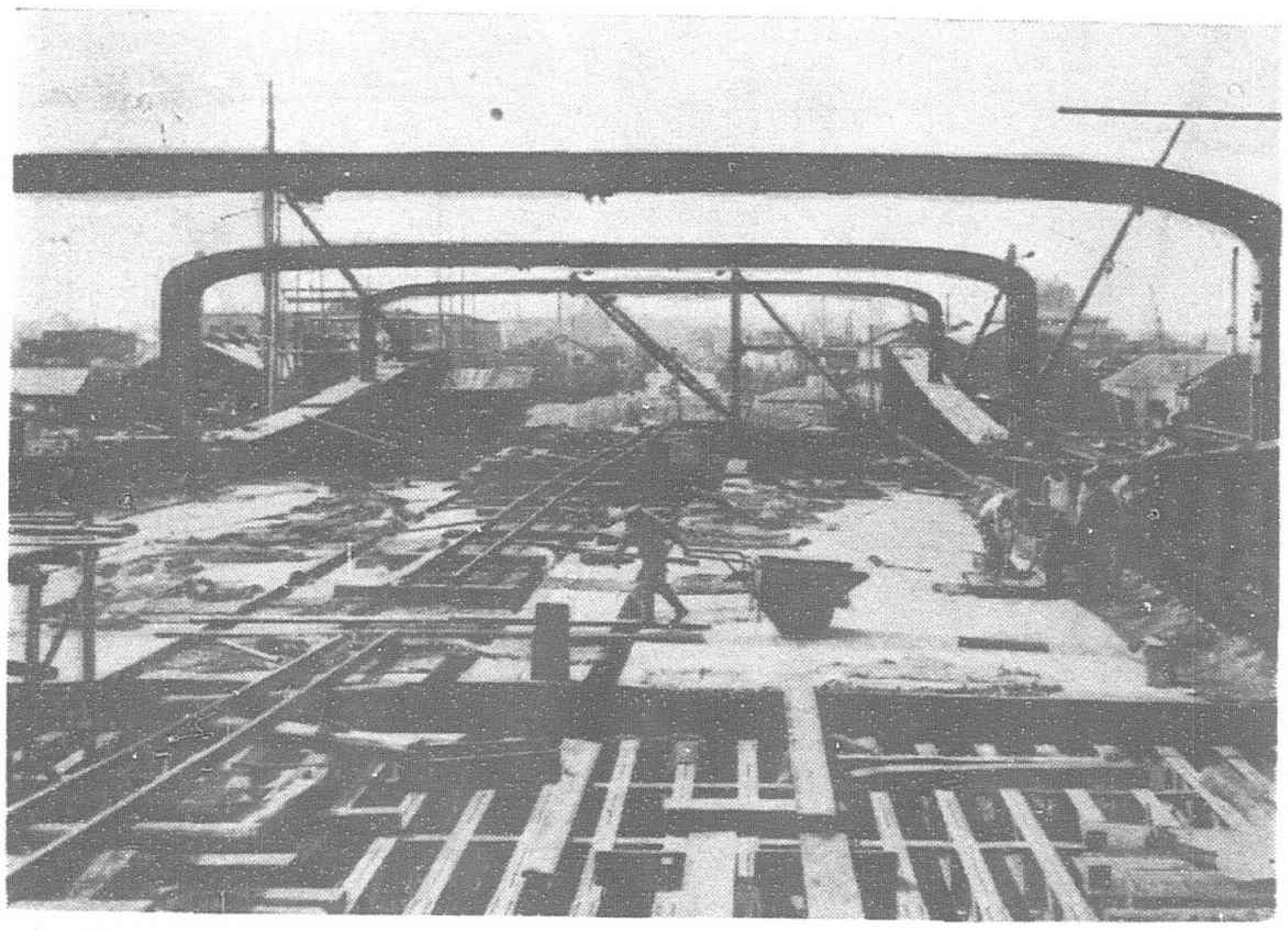

One of the granite-faced bridge piers before being completed


Lock pins, such as the one pictured here, operate at the cantilever ends of the four main beams of the bascule bridge leaves

way of insuring against scouring action from the flow of water. The constant passage of river craft and other factors interfering with smooth progress of the work, such as a water flow of 1.5 meters a second, a flood tide rise of six meters and the conduit pipes of the city waterworks laid quite close to the river bottom, entailed laborious efforts from engineers entrusted with construction.

The Central Span

The central span of the structure is a double-leaf trunnion bascule bridge connected to both banks of the Sumida by tied-arch steel bridges. Each of these fixed spans is 86 meters in length and weighs approximately 1,800 metric tons, consisting mostly of steel. The entire bridge will have in it more than 9,000 metric tons of iron and steel, including 6,000 tons of steel girders. The fixed section on the Tsukishima side and the central movable span were finished during the past spring, and work is now approaching completion on the section to connect with the Tsukiji mainland. Along the center surface of the whole span double tracks for a



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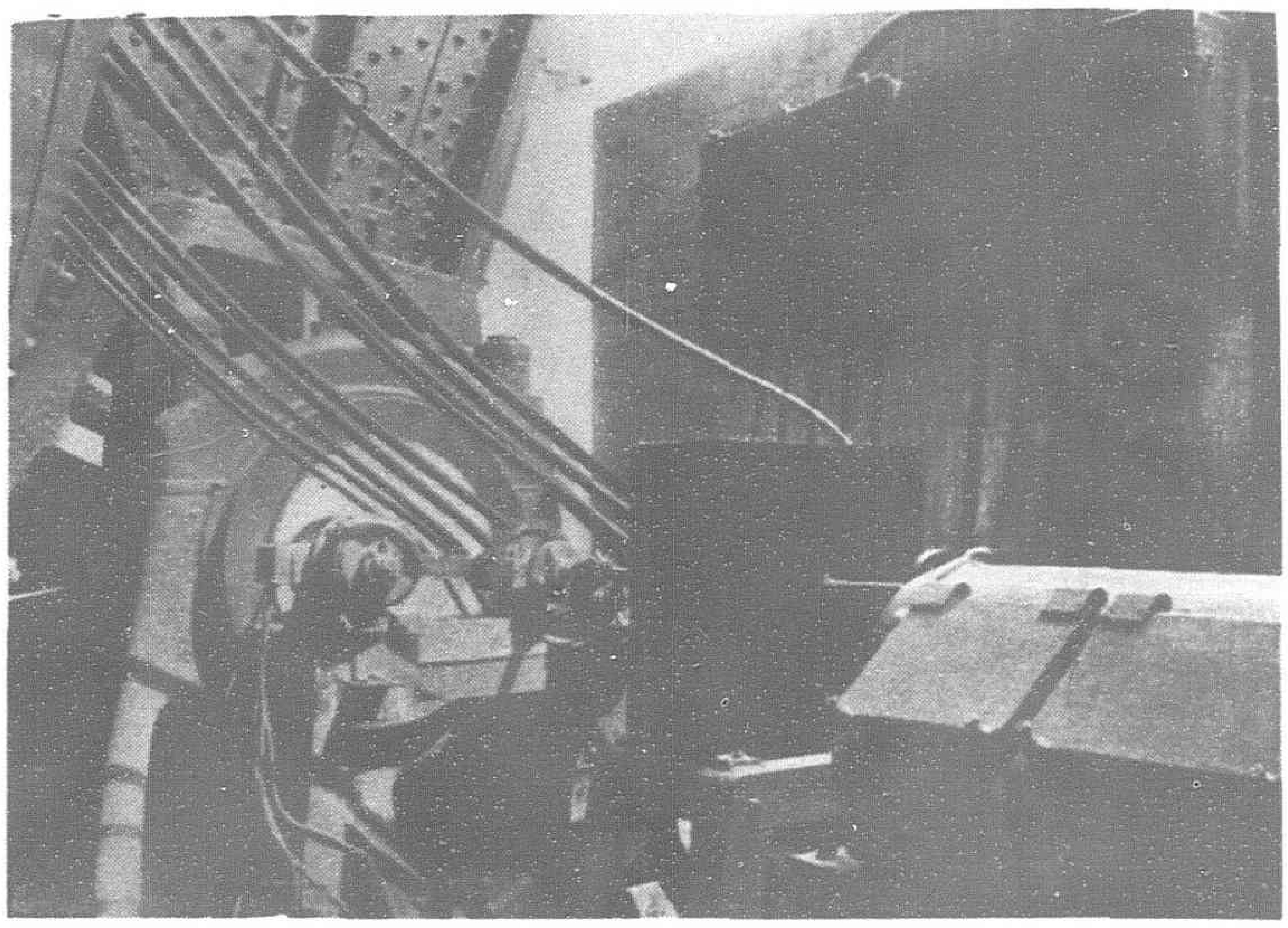
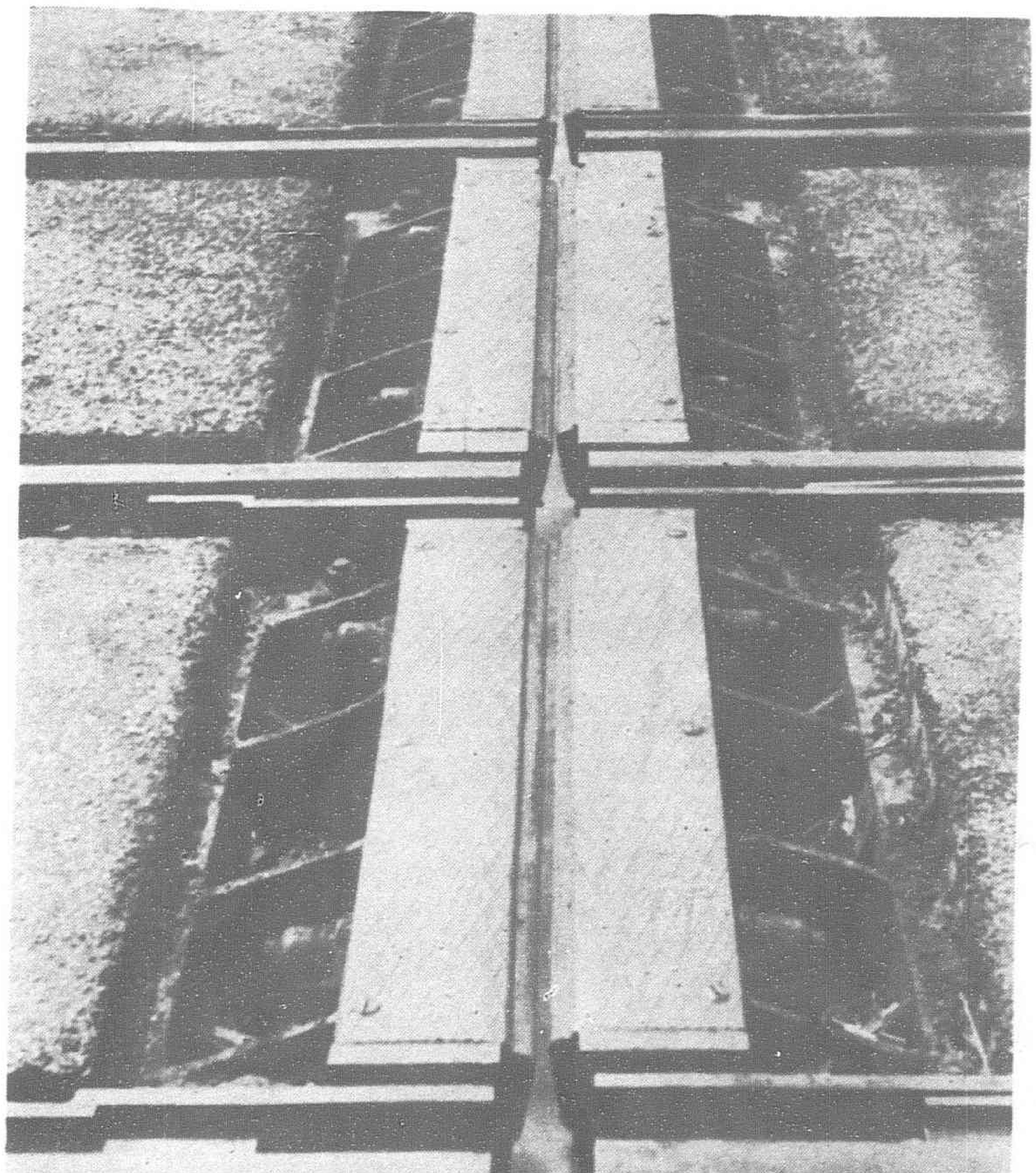
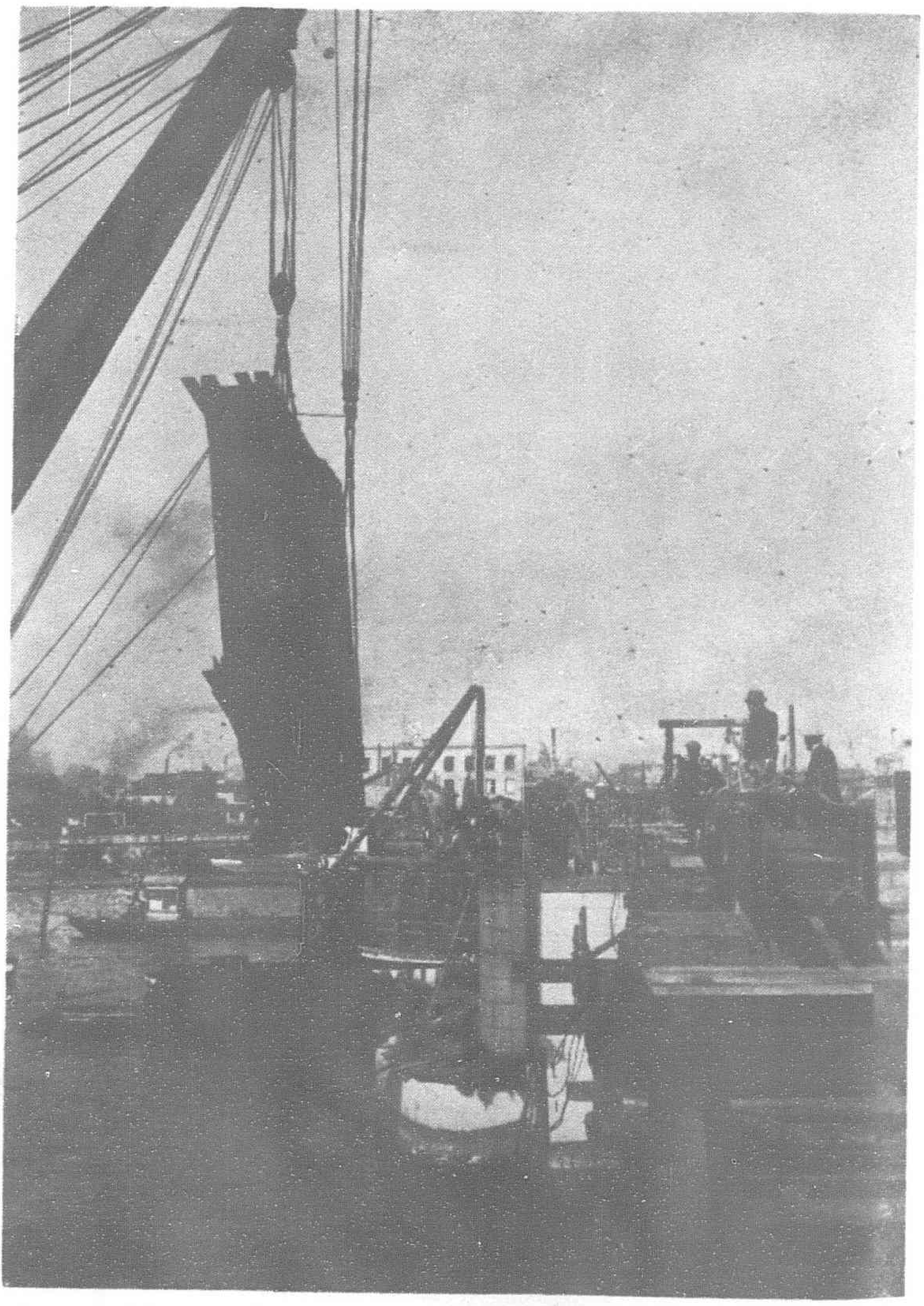
A view of final construction work recently under way along the 74-meter central span of the Kachidoki drawbridge



Trunnion shaft mechanism on the pier nearest the mainland with the bascule lever raised

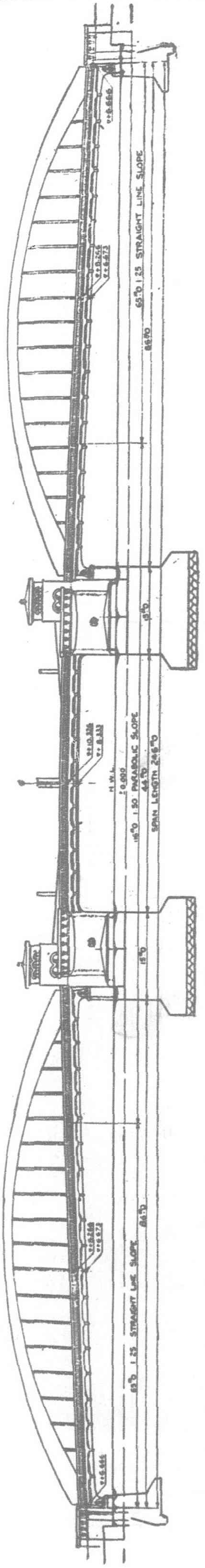


When the drawbridge leaves are lowered to the usual horizontal plane, their surface edges meet with no clearance and interlock automatically by means of a patented mechanism devised by Japanese engineers



Intended for one of the bascule leaves, this 45-metric ton structural steel section was photographed in mid-air before being set into place by crane arm

2.



Showing details of the bascule bridge two-thirds constructed at the former Kachidoki ferry crossing of the Sumida River linking Tsukishima Island with the Tsukiji District of Kyobashi Ward. Original estimated cost of this structure was Y2,650,000 but final cost is set at Y4,200,000

trolley car line are being laid.

The abutment structures anchoring the two fixed spans to the opposite river banks are built of reinforced concrete, the exposed surfaces of which are faced with native granite slabs. These abutments are 28.38 meters in length, eight meters wide and 9.7 meters high, with their foundations extending 6.4 meters below the ebb-tide level. Cofferdam work was necessary in this construction.

The two mid-stream piers are also constructed of reinforced concrete strengthened with steel framework. The piers are each 38.4 meters long, 19 meters in width and 15.3 meters high. Their bases extend nine meters below the ebb tide level. The large size of these piers was required to house the counterweight mechanism of the cantilever leaves as well as other operating machinery for the drawbridge. All exposed surfaces of the piers are also surfaced with granite.

Details of Central Span

The movable 74 meter long central span of the bridge is of the fixed-axis, double-leaf cantilever type. Its foremost feature is the two bascule leaves, each leaf constructed of two rectangular steel girder beams projecting from each of the mid-river piers, and each leaf capable of opening at the center to a maximum gradient of 70 degrees. These main girder beams are 25.8 meters in length from their axes of rotation to the cantilever ends. The rear portion of each beam is fan-shaped with a 7.2 meter radius, and it is mounted for movement upon a giant quintuple rack, which has a reduction ratio of 2340 to 1. The two main beams placed 18.8 meters apart and parallel to each other on the leaves, are connected to the rear fan-shaped section by means of counterweights. These are formed in the shape of a huge box and are filled with lead ingots, pig iron and scrap steel concrete, all weighing about 1,100 metric tons. They act to balance the weight of the leaves while in process of lifting the bascule structure, the total weight of each being 2,000 metric tons, including the 900 ton leaf itself. This corresponds to the combined weights of 35,000 to 36,000 average-sized people.

The main pinion gear, shown above, is part of the intricate system of cog-wheels used to raise the two 2,000-ton leaves of the bridge

The road surface of the leaves of the bridge is covered with ferro-concrete slabs, consisting of floor beams and stringers. The footpaths are paved with cypress boards and the balustrades are formed in most part from steel. The two movable sections function as well-sweeps upon their supporting axes, and all material used in constructing the double leaves was designed to maintain adequate equilibrium.

A row of wedge-shaped cast iron members is attached to the cantilever end of each leaf. They serve to compensate for contraction and expansion of the leaves caused by varying degrees of temperature. These teeth-like wedges are equipped with springs, enabling the leaf ends to fit snugly when in a closed position but to separate readily when raised. The leaves when on a horizontal plane are fixed firmly by means of lock-pins operated electrically. Without them, heavy bridge traffic passing across an unlocked span would tend to produce a live load stress of destructive proportions.

Variable Voltage System

The Ward-Leonard variable voltage system was adopted as most suitable to operate the main motor equipment for the bridge. It has no complicated switching and control devices, thus guaranteeing against excessive torques or overload conditions hazardous to hoisting machinery and electrical apparatus. The movable leaves are raised by a pair of 125 h.p. D.C. electric motors installed on both of the two piers, one of each set being a spare. They are arranged so as to be capable of producing twice the output when coupled. The leaves are adjusted for lifting to a 70 degree angle within 70 seconds in a wind velocity of 22 meters. In calmer weather all the available power will not be needed to operate the

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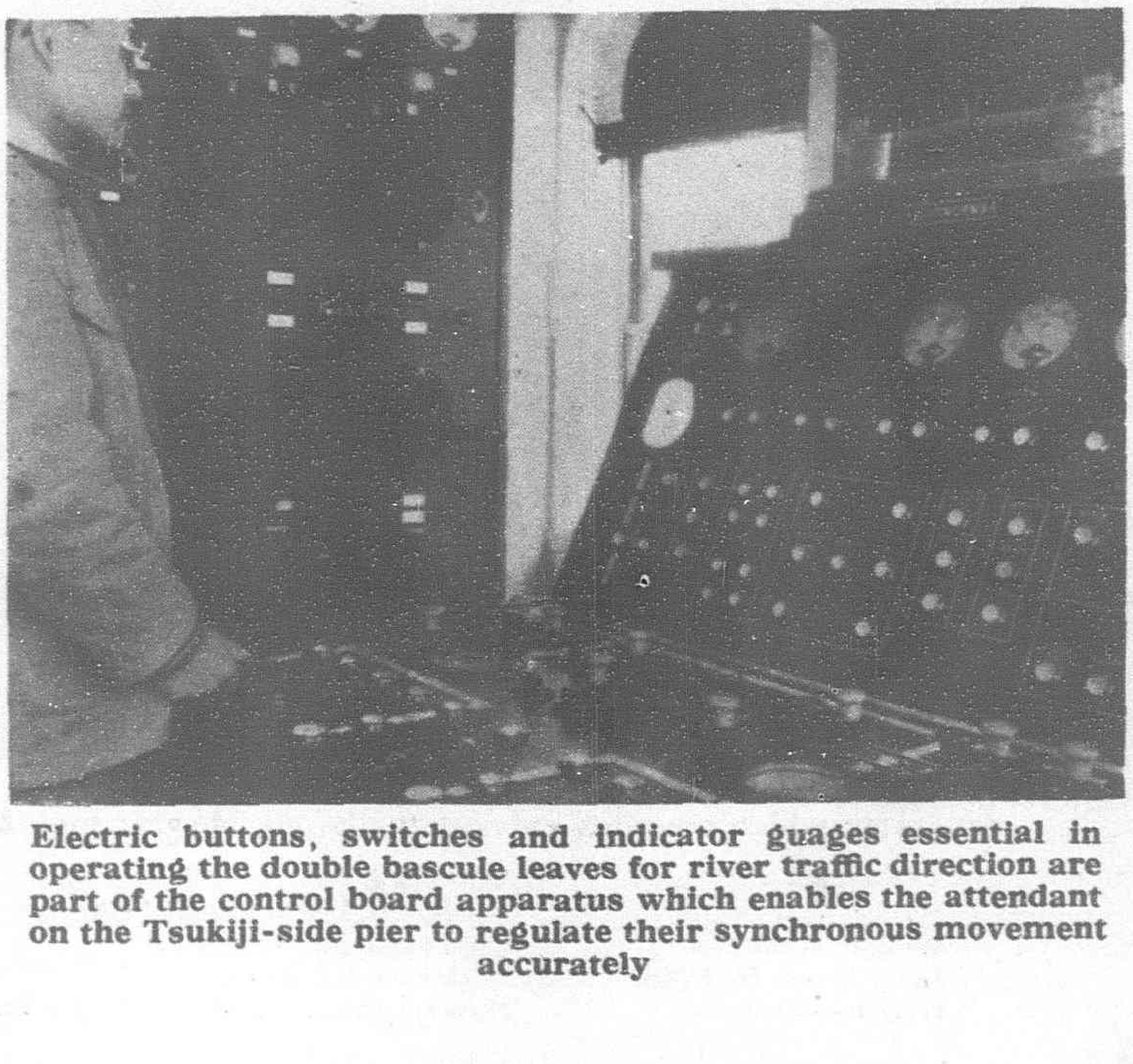


Electric buttons, switches and indicator guages essential in operating the double bascule leaves for river traffic direction are part of the control board apparatus which enables the attendant on the Tsukiji-side pier to regulate their synchronous movement accurately

General Electric Completes First Steam-Electric Locomotive

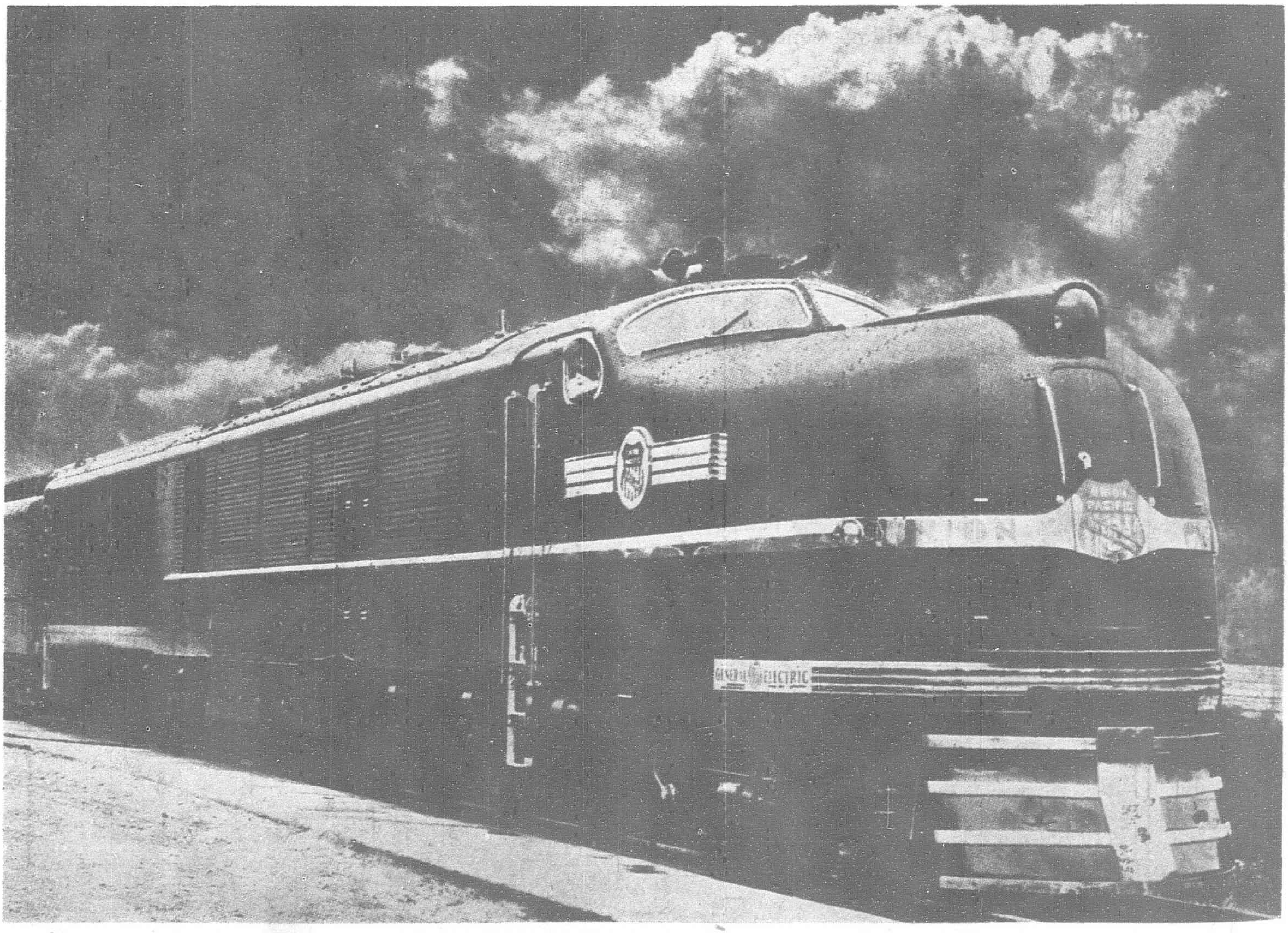
A 5,000-h.p. steam-electric passenger locomotive just completed for the Union Pacific Railroad in the U.S. is without question the most forward-looking design of motive power since the beginning of railroading. Turbine-driven locomotives and some turbine-electric locomotives have been constructed in Europe, but, in general, they followed the principal elements of design of the conventional steam locomotive.

Nearly two years have been spent by General Electric and Union Pacific engineers in designing and building this new locomotive for handling one of the most important passenger schedules in American railroading. It is proposed to operate a 12-car train of pullman and standard passenger cars between Chicago and the Pacific Coast, handling this train over 2.2 per cent grades without helper. Climatic conditions encountered *en route* range at different seasons from 40 degrees below zero Fahrenheit to 115 degrees above. Some of the mountain passes through which the locomotive will haul are at altitudes exceeding 8,000 feet above sea level.

While the steam-electric locomotive is distinctly a new type of motive power as a unit, the various pieces of apparatus which go to make up the locomotive have, for the most part, been thoroughly tried out and have demonstrated their reliability in actual service. The assembly and arrangement of the equipment of this locomotive follow, in general, the practice in modern high-efficiency power plant work. Because of the necessity for light weight and the limited space requirements, some use has been made of experience gained in the installation of equipment on shipboard.

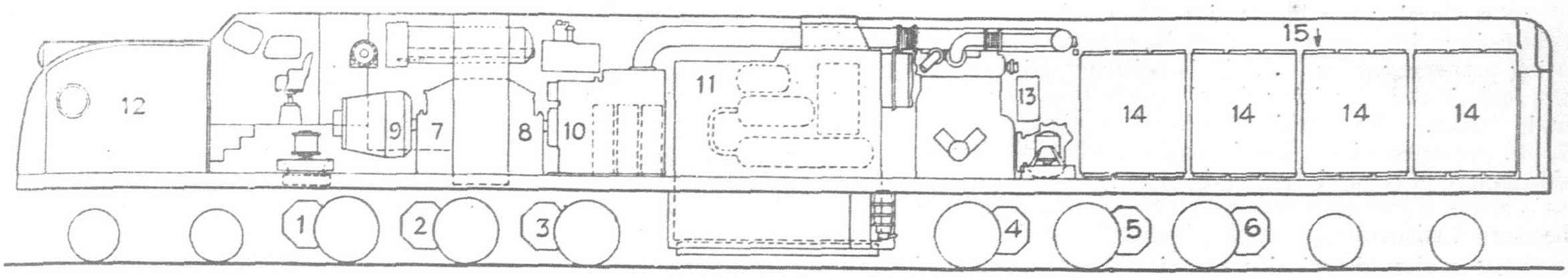
The boiler equipment differs from central station practice in the substitution of forced instead of natural circulation of the water through the tubes surrounding the furnace. The steam generated passes to a separator, where the excess water is removed by centrifugal action and then drained to the hot well. From the separator the steam goes through the superheaters and thence to the turbines. The exhaust steam goes to the condensers and the water returns to the hot well. The construction of this type of boiler precludes the possibility of any dangerous rupture due to any cause.

The electric motors, generators and control do not differ materially in design and construction from similar equipment supplied to trains now running. Briefly, then, the chief problem is the co-ordination of the several pieces of apparatus which go to make up the complete unit.



The steam-electric locomotive is in two units, one of which is shown here. In each unit a steam turbine drives an electric generator which supplies current to the six electric motors on the axles. Information given below applies to each unit.

Top speed—125 mhp
Power—2,500 h.p.
Weight—265 tons
Length—90-ft. 10-in.
Height—15-ft.
Width—10-ft.
Fuel used, low grade oil ("Bunker C")
Fuel capacity—3,000 gal.
Water capacity—4,000 gal.
Steam conditions—1,500 lb. per sq. in. at 920 F.
Traction generation and motors—direct current
Auxiliary Power—220-volts, alternating current
Mileage between water or fuel Stops—500—700 miles



Main Parts

1-6	Traction motors
7-8	Main generators
9	Alternator
10	Turbines
11	Boiler
12	Water tanks
13	Steam control panel
14	Condensers
15	Fuel tanks

The operating advantages of the steam-electric locomotive include:

(*a*) Thermal efficiency from fuel to the driving wheels more than double that of the conventional steam locomotive.
(*b*) Electric braking resulting in savings in brake shoes and tyres, not only for the locomotive, but for the entire train.
(*c*) High rates of acceleration and braking due to high adhesive weight.
(*d*) Capacity for 500 to 700-mile performance without stops for fuel or water.
(*e*) Elimination of corrosion and boiler scale due to use of distilled water in a closed system.
(*f*) Elimination of unbalanced reciprocating parts which set up destructive forces in the rails, road bed, and supporting structures.
(*g*) Greater availability due to the construction of the boiler and absence of reciprocating parts.

Construction of Mechanical Portion

The locomotive consists of two identical units capable of either multiple or independent operation under the control of a single engineer. Each unit consists of a 2-C-C-2 running gear surmounted by a single-ended streamlined cab.

The running gear of each unit consists of two three-axle driving trucks and two two-axle guiding trucks. The truck frames are integral steel castings. All wheels are of the solid type and all journals are carried in anti-friction bearings. The cab structure is mounted on center plates, and the platform takes the buffing and pulling stresses. A flexible metal sleeve with sliding connection supplies ventilating air from centrifugal blowers located in the cab to each traction motor. The swivel truck arrangement provides room between the driving trucks for a well-type construction containing the steam boiler in the central part of the cab.

To secure smooth running at high speeds, restraint devices are used between the main trucks and cab and between guiding trucks and main trucks. Side bearing pads on each main truck give the cab additional support.

The cab is designed to secure the lightest possible construction consistent with the requirements of strength and rigidity. The frame is built up with high strength steel tubular members, and aluminum cab sheets are employed except for the streamlined nose, which is of steel welded throughout. In the fabrication of the cab, welding is largely used, except for the aluminum sheets, which are riveted in place.

The locomotive is designed for single-end operation, with streamlining to minimize wind resistance. The front coupler is normally retracted and covered by a removable panel which conforms to the streamlined contour of the pilot structure.

Clasp brakes are used on both driving and idle wheels with four shoes per wheel on the drivers. The braking on these drivers is supplied from two cylinders per axle.

A new high-speed air brake equipment suitable for use with both new and conventional trains has been included.

To facilitate maintenance, provision is made for replacing any unit of the power plant or electrical equipment, including the main boiler, in a few hours. Traction motors may be removed in a drop-pit. Other equipment can be removed by a crane through the roof.

Each cab encloses the following principal elements: a complete 2,500-h.p. geared turbine-driven generator set; a high pressure steam boiler, a compactly built turbine-driven auxiliary set with full automatic control; and a finned tube air-cooled condenser with turbine-driven fans for cooling.

The design of this locomotive is unusual in many respects, some of which are:

(*a*) The use of 1,500 lb. per sq. in., 920 F-degree steam.
(*b*) A type of boiler not previously used for railroad service.
(*c*) Complete automatic control of boiler, auxiliaries and power units.
(*d*) Provision for electric braking of sufficient capacity for holding trains on grades and for assistance in making service stops.
(*e*) Head-end auxiliary power for air conditioning and other train electric service.

Many other features are incorporated in the design for the purpose of effecting economies in operation, simplifying the duties of the operator, lengthening the cruising radius and reducing maintenance cost.

This new Union Pacific locomotive is particularly adapted to lines where full electrification is not justified, but where superior passenger schedules are demanded. Each cab of this locomotive has the following ratings, weights and dimensions:

Wheel arrangement per cab	2-C-C-2
Total weight with full tanks of fuel and water	530,000 lb.
Weight on driving wheels	342,000 lb.
Weight per driving axle	57,000 lb.
Fuel oil capacity	3,000 gal.
Water capacity	4,000 gal.
Total length over couplers	90-ft. 10-in.
Overall width	10-ft. 8¾-in.
Maximum height	15-ft. 0¾-in.
Maximum rigid wheel base	13-ft. 4-in.
Diameter of driving wheels	44-in.
Diameter of guiding wheels	36-in.
Rating of main turbines	2,500 h.p.
Number and type of traction motors each unit	6-GE-725
Gear Ratio 65/31	2.097
Maximum operating speed	125 mph.

In order to obtain the capacity, flexibility and efficiency essential to the best train operating characteristics, the power equipment has been designed to respond promptly to sudden demands for power. The rate of firing therefore increases and decreases automatically with the load demand.

Steam Boiler.—The steam boiler and automatic control equipment were designed and built by Babcock and Wilcox and the Bailey Meter Company, builders of boilers and steam control, in collaboration with General Electric. The boiler is a water-tube forced-circulation type, compactly built, incorporating a furnace, superheater, economizer, air pre-heater, and burners for Bunker "C" fuel oil. Special provisions are made to withstand shock and vibration resulting from the movement of the vehicle over the rails.

By replenishing water losses in the closed system with evaporator steam, practically all scaling and corrosion of the tubes are eliminated. The construction of the boiler unit and its 3-point supports furthermore avoids distortion of the tubes due to normal movement of the locomotive.

The economizer is an integral part of the boiler and utilizes waste heat for increasing the temperature of the boiler feed water. Several boilers of this type have been built by Babcock and Wilcox and are successfully handling commercial service in stationary plants.

For starting the locomotive when cold a small vertical fire-tube boiler with a capacity of 100 lb. of steam per hour is provided, using propane gas for fuel. This boiler supplies steam for heating the fuel oil and atomizing the oil at the burners when starting the main boiler. The auxiliary boiler is designed for a pressure of 75 lb. per square inch, and is used only for starting when an outside supply of steam is not available. Where steam can be secured at a round house or from an external source the main boiler can be started without the use of this auxiliary.

A complete description of this type of power unit has been published in *Mechanical Engineering* for December, 1936.

Main Turbine Set.—The main turbine generator set consists of the following elements :

(*a*) High-and low-pressure turbines.

(*b*) At two-armature direct-current generator driven through gear reduction approximating ten to one from these turbines. This generator is self-ventilated from a fan located between the armature, the air being drawn in through the commutator risers and discharged at the center through the roof of the locomotive. In cold weather this warm air can be utilized for cab heating.

(*c*) A 220-volt 3-phase alternating-current generator connected to the main generator shaft through a flexible disk coupling. This alternator furnishes power for train air conditioning, traction motor blowers, and other accessories.

(*d*) A variable voltage exciter, the armature of which is mounted on the same shaft as the alternator. This machine supplies excitation for the main generator during motoring, and for the traction motors during electric braking.

Auxiliary Set.—The auxiliary set is a variable speed unit driven by a turbine which takes steam extracted from the main turbine. Its speed therefore varies somewhat with the traction load on the main turbine. This speed is further controlled automatically in accordance with the steam demand from the main boiler. Its function is to supply and regulate the combustion air and fuel oil delivered to the furnace, and also to supply feed water in proportion to the demand for steam. The complete set consists of the following parts ; a starting motor, an auxiliary turbine, combustion air fan, boiler feed pump and fuel oil pump.

Lubricating Pump for Auxiliary Set.—A rotary-type pump is independently driven by a direct-connected 125-volt direct-current motor. This pump is used for circulating lubricating oil to the reduction gearing, gear shaft bearings, turbine bearings and feed water pump bearings. The circulating oil is cooled by radiators located with the condenser units.

Condenser Fan Turbine.—This unit is also independent of the auxiliary set drive, but is mounted on the same support. This turbine operates at a variable speed which is dependent on the condensation requirements but has a maximum speed of about 12,000 r.p.m.

Condenser.—The condenser is mounted on each side of the rear end of the locomotive cab, and consists of finned-type vertical tubes. Headers at the top receive the exhaust steam from which the condensate is drained by gravity to a sump-tank under the locomotive cab. Ventilation for the condenser is provided by turbine-driven propeller-type fans drawing air through the sides of the locomotive and discharging it through openings in the roof.

As a part of the condenser equipment there is a steam-operated vacuum ejector for extracting small quantities of air which may leak into the closed system. This ejector normally will function under partial vacuum conditions down to 5 lb absolute.

In normal operation the condensed water in the tank located under the locomotive cab is maintained at a constant level by a float switch. Provision is also made for the addition of make-up water as required. Water from this tank is pumped into another tank located high in the cab, using a centrifugal type pump. In normal operation the upper tank will be kept full, the excess water overflowing and returning to the lower tank. Another pump transfers the water from the upper tank to the suction side of the feed water pump. From this point the water passes through the feed water heater, the economizer, thence to the boiler tubes and then to a separator drum, from which excess water is returned to the sump. The steam passes through the superheater and turbines and back to the condensers.

Low Pressure Steam.—A continuous supply of low pressure steam is required for train heating, the operation of the air compressor turbine, and for heating fuel oil. For this purpose a heat exchanger or evaporator is used, consisting of a coil immersed in raw water. This coil takes steam either direct from the main boiler or by extraction from the main turbine. In either case the pressure is reduced before entering the coil.

Water is supplied to the evaporator by three reciprocating pumps driven by direct-current motors.

Turbine Compressor Set.—A 150 cu. ft. double-stage air compressor designed to supply 125-to 135-lb. pressure is driven by a steam turbine operating at 200-lb. pressure and driving through a reduction gear. This compressor set is regulated by a governor which operates a shut-off valve in the turbine supply, starting and stopping the set as required.

Auxiliary Compressor Set.—A 15-cu. ft. compressor supplying air at 90-lb. pressure and operated by a 125-volt direct-current motor is provided for supplying air for operating the Bailey regulating devices and control equipment during starting when no steam is available for operating the turbine compressor set.

Electrical Circuits

This type of locomotive is essentially an electric locomotive carrying its own power plant. Since the main generator, however, is used solely for furnishing power to the traction motors, advantage is taken of the opportunity to regulate the train speed by varying the generator voltage, thus avoiding rheostatic losses. Acceleration of the train, therefore, is effected by controlling the current in the exciter field by means of the master controller, thus regulating the field current in the main generators. The main generator current is thus supplied to the axle-hung, geared traction motors at varying voltages, depending upon the demand for power and speed.

Control current is supplied by a 125-volt motor-generator set with a battery floating on the line. Both acceleration and electric braking are regulated indirectly through the master controller.

This master controller includes an accelerating handle, an electric braking handle and a reverse handle. The reverse handle is also used as selector handle for motor combinations in each direction. Provision is made for operating the motors in three combinations—series, series-parallel and parallel. Both the accelerating and braking handles normally hold a fixed kilowatt load on each controller step, except during the first few motoring steps, where approximately constant tractive effort increments are obtained.

Auxiliary Circuits.—The primary power for the auxiliaries is supplied by the alternating-current generator. In addition to the operation of the two traction motor blowers this unit also supplies the motor-generator sets, supplying 125 and 64 volts direct current. Lighting circuits and headlights are also supplied from this alternating-current source. Plug receptacles on the exciter of the locomotive at both sides permit obtaining alternating-current power from an outside supply. The 64-volt motor-generator set supplies power for the standard train circuits.

Automatic Control Features.—The power plant is entirely automatic in operation and there are no power plant pressure or temperature gages in the operating cab. These devices are located on a control board situated in the apparatus cab. In the event of the operation of any of the protective devices, a warning gong rings in the apparatus cab and an indicating lamp shows at the engineer's position.

Automatic train control and cab signal equipment of the continuous type with suitable inductors for operation over Union Pacific lines are installed on both units.

The mechanical and electrical parts of this locomotive were manufactured in the Erie plant of the General Electric Company of New York, the boiler was supplied by the Barberton plant of the Babcock Wilcox Company, and the boiler control devices by the Bailey Meter Company of Cleveland. The locomotive is now undergoing commercial tests and upon the completion of these runs will be placed in revenue service by the Union Pacific Railroad.

The City of Nagoya

NAGOYA is the third largest city in Japan, coming after Tokyo and Osaka. To the north extends the fertile plain of Nobi watered by the Kiso, Nagara and Ibi Rivers, and to the south stretch the calm waters of Ise Bay. The climate is temperate. Thus this district has developed steadily from early times, becoming one of the centers of communication between East and the West of Japan. Especially in the sixteenth century such great men in our history as Oda Nobunaga, Toyotomi Hideyoshi, Tokugawa Ieyasu, and others came from this place or its vicinity. After the construction of Nagoya Castle, famous for its golden dolphins, Tokugawa Yoshinao became the feudal lord of the district, and Nagoya grew into a large and prosperous city on the Tokaido. After the Restoration of Meiji, with the opening of railways and the construction of harbor works, the city developed rapidly, and now, together with Tokyo and Osaka, divides the country practically into three parts, and has become the actual, as well as the nominal, center of mid-Japan.

The city by no means boasts of her famous sights or historic remains, but is proud of the fact that she is still in her youth and showing remarkable progress, particularly in her commerce and industry.

Nagoya measures 16 kilometers from north to south, and 15 from east to west, with an area of 148 square kilometers, which is exceeded only by that of Osaka. This large area is the result of necessary annexations from time to time of a number of adjacent towns and villages. A historical sketch of this expansion is as follows :—

In 1889, when the city was incorporated, the area was fourteen square kilometers, in 1896 it was fifteen square kilometers, in 1907 thirty-nine square kilometers, in 1921 one hundred and forty-eight square kilometers.

The present population of Nagoya, from registration compiled at the end of 1929, is 1,001,838. This is 8.7 times the population recorded in 1877, half a century ago.

Nagoya Communications

Nagoya is called "Chukyo," or Central Capital, and in former times it was an important stage known as "Miya" on the Tokaido (Highway), where the traffic was very heavy. But since the introduction of modern methods of travel, and especially since the construction of railways, this center of traffic has grown rapidly in importance.

Not only is Nagoya Station an important intermediate station on the Tokaido Main Line, but it is also a terminus of the Kansai Line which goes to Osaka, passing through Mie and Nara Prefectures, and of the Chuo Line which running through Gifu, Nagano, Yamanashi, and other Prefectures finally reaches Tokyo. It is thus one of the most important railway centers in all Japan. Besides these lines there is direct connection between the station and the harbor, in order to link up the transportation by land and water. Within the city limits, besides Nagoya Station, there are Atsuta, Chikusa, Ozone, Hatta, Shiratori, Horikawaguchi, and Nagoya Harbor Stations, making eight in all. The number of passengers using these stations in the course of one year is approximately fifteen millions, while nearly three million tons of goods are handled.

In addition to these Imperial Government Railways, there are a number of private electric railways operating radial lines from the city, putting it into close connection with a large number of cities and towns in the neighborhood. The principal lines are listed below :—

(1) MEIGI RAILWAY COMPANY (189.8 kilometers) from Yanagibashi, Nagoya, to the city of Gifu, Ichinomiya and the towns of Inuyama, Tsushima.

(2) AICHI ELECTRIC RAILWAY COMPANY (122.2 kilometers) from Atsuta Jingu Mae (in front of the Atsuta Shrine), Nagoya, to the city of Toyohashi and the town of Tokonabe.

(3) SETO ELECTRIC RAILWAY COMPANY (21 kilometers) from Horikawa, Nagoya, to the city of Seto.

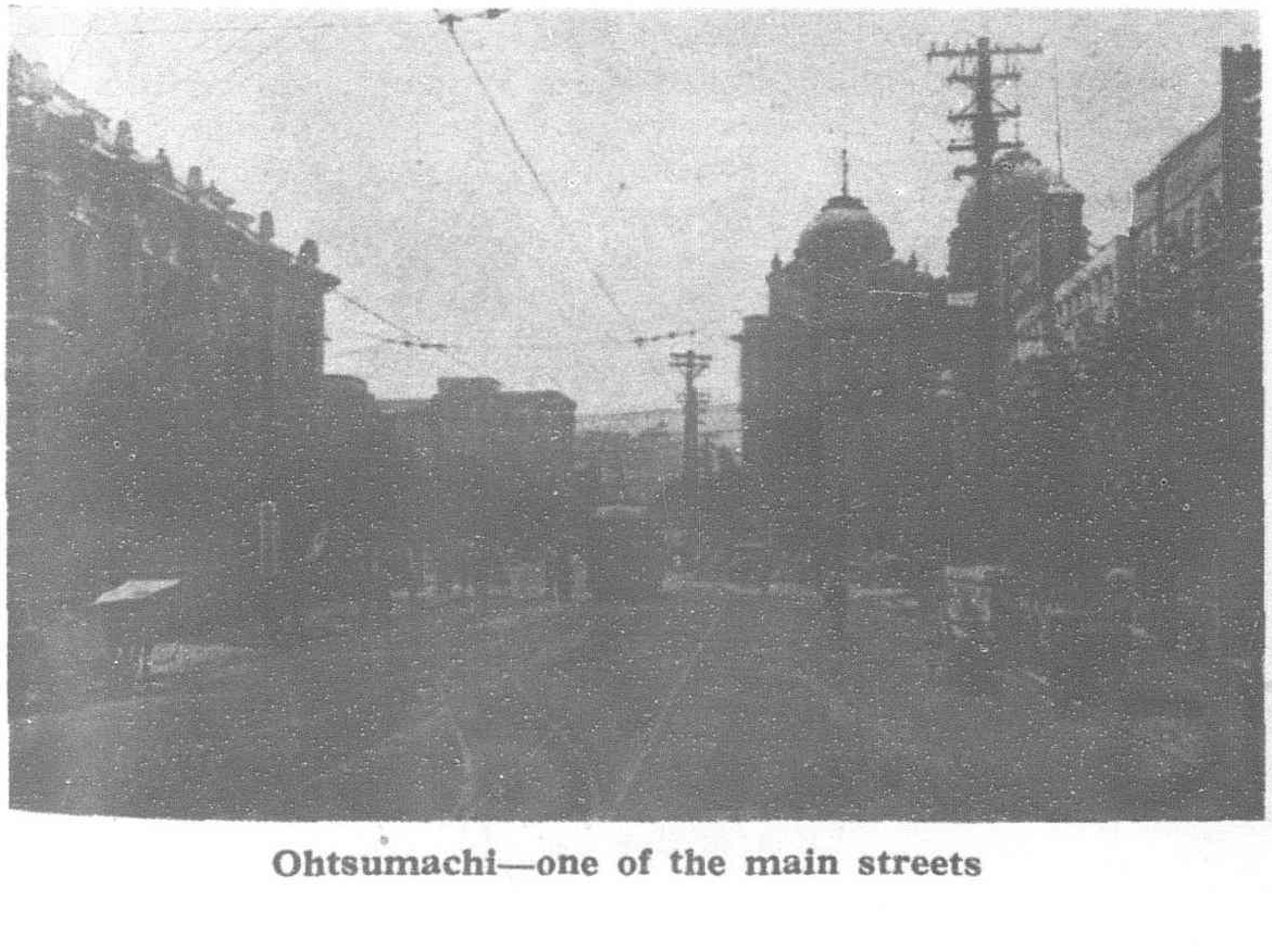
(4) SHIMONOISHIKI ELECTRIC RAILWAY COMPANY (6.5 kilometers) from Atsuta Shin-oto, Nagoya, to the town of Shimonoishiki.

Turning to transportation within the city, there are 2,420 kilometers of streets covering about one eighteenth of the total area of the city. The width and arrangement of these streets, however, are not satisfactory, so that great efforts are being made in connection with the work of city planning to broaden and systematize them. For example, a street will soon be built having a width of 43.6 meters.

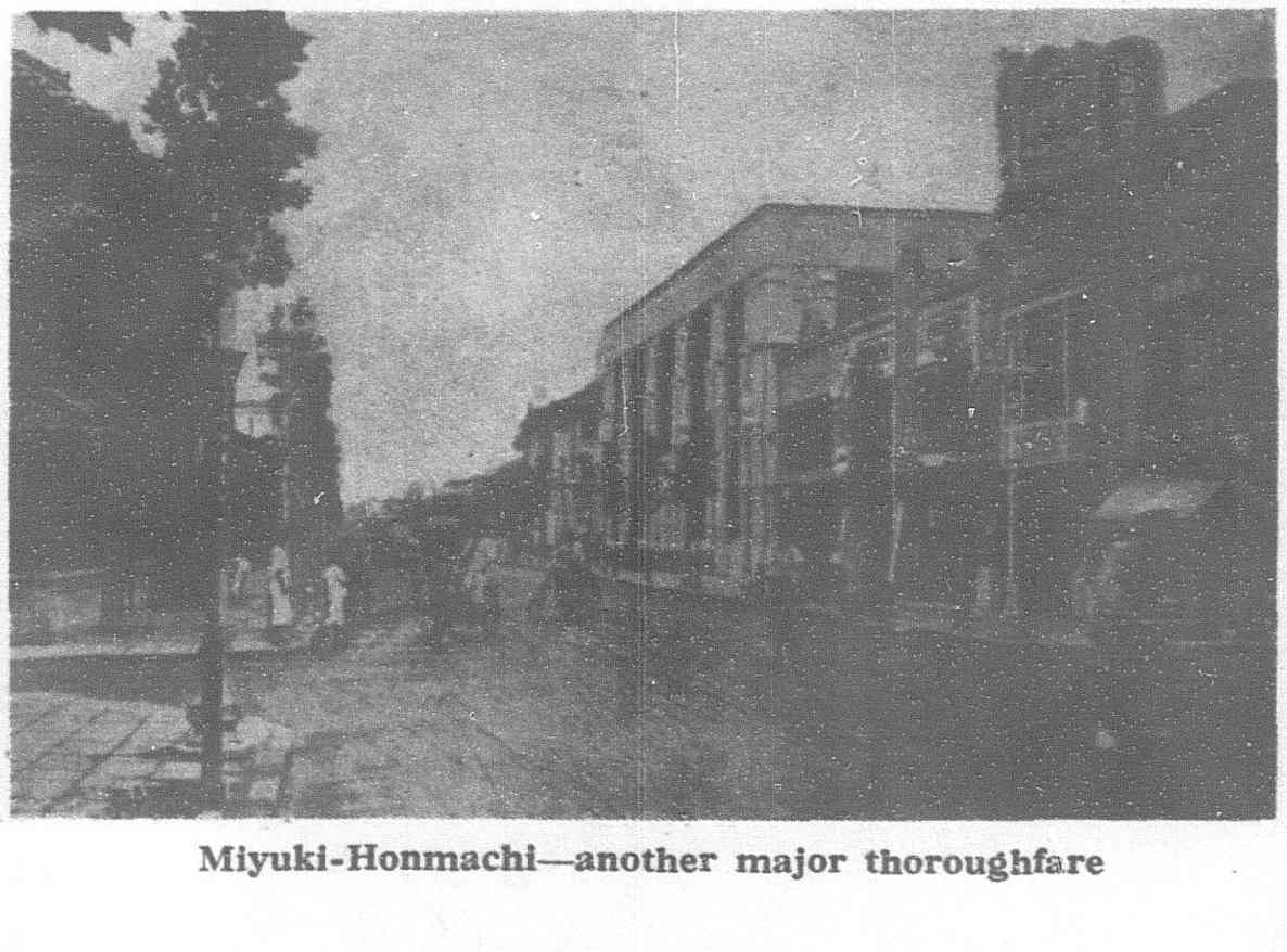
The street railway system, is owned and operated by the municipality : it has 53.5 kilometers of track on the main streets, and carries a total of 100,000,000 passengers annually. This service is supplemented by the Tsukiji Electric Railway, Shin-Mikawa Electric Railway and Nakamura Electric Railway. These private lines make connections between the center of the city and the outlying parts. Light motor-buses are operated on all the principal streets at a uniform fare of six sen. These greatly facilitate the rapid transportation of the people.

Satisfactory progress has been made in all methods of transportation by land. In keeping with this has been the development made in conveyance by water, and it is expected that in the future it will make still greater advances.

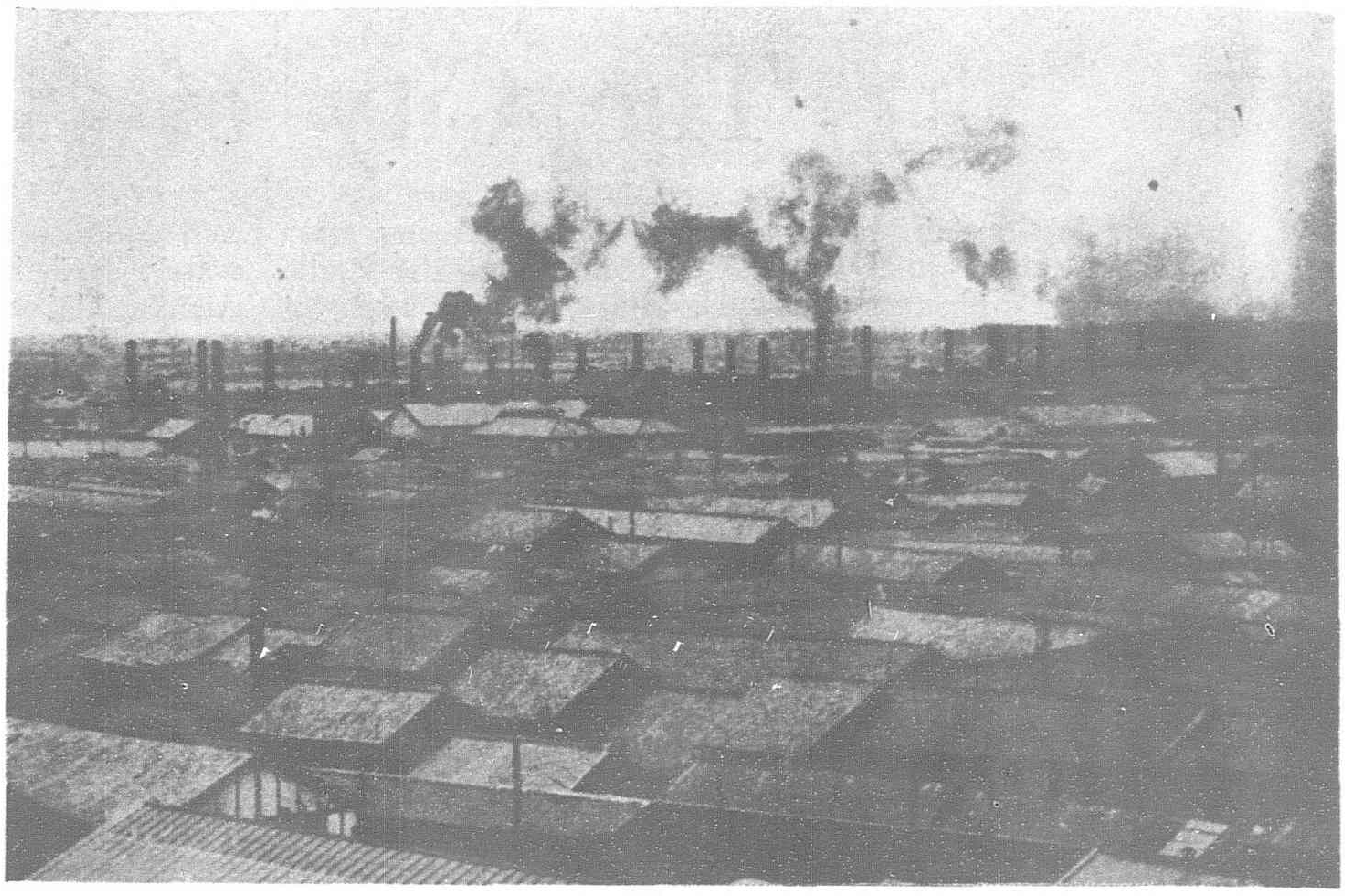
In regard to Post and Telegraph service there are sixty-six offices throughout the city. The number of letters and cards posted in 1928 was more than 108 million, while the parcels dispatched numbered 2,000,000 : incoming mail handled was approximately the same. There is, of course, a steady increase year by year. The number of telegrams handed in the same year was, in round numbers—dispatched, domestic 1,326,000, foreign 19,000;



Ohtsumachi—one of the main streets



Miyuki-Honmachi—another major thoroughfare



Porcelain factories in Nagoya

received, domestic 1,197,000, foreign 21,300. For wireless messages, a dispatching station at Yosami, and a receiving station at Yokkaichi, both towns near Nagoya, have recently been opened. These stations are supervised and operated by the Nagoya Central Post Office, and at these stations communication is maintained with Germany, Poland, France, and Great Britain.

Telephones are a Government Monopoly in Japan. In Nagoya there are 21,325 subscribers. There are 26 lines to Osaka, and 15 to Tokyo, besides lines to other cities and towns by means of which connection can be made with any point in Japan.

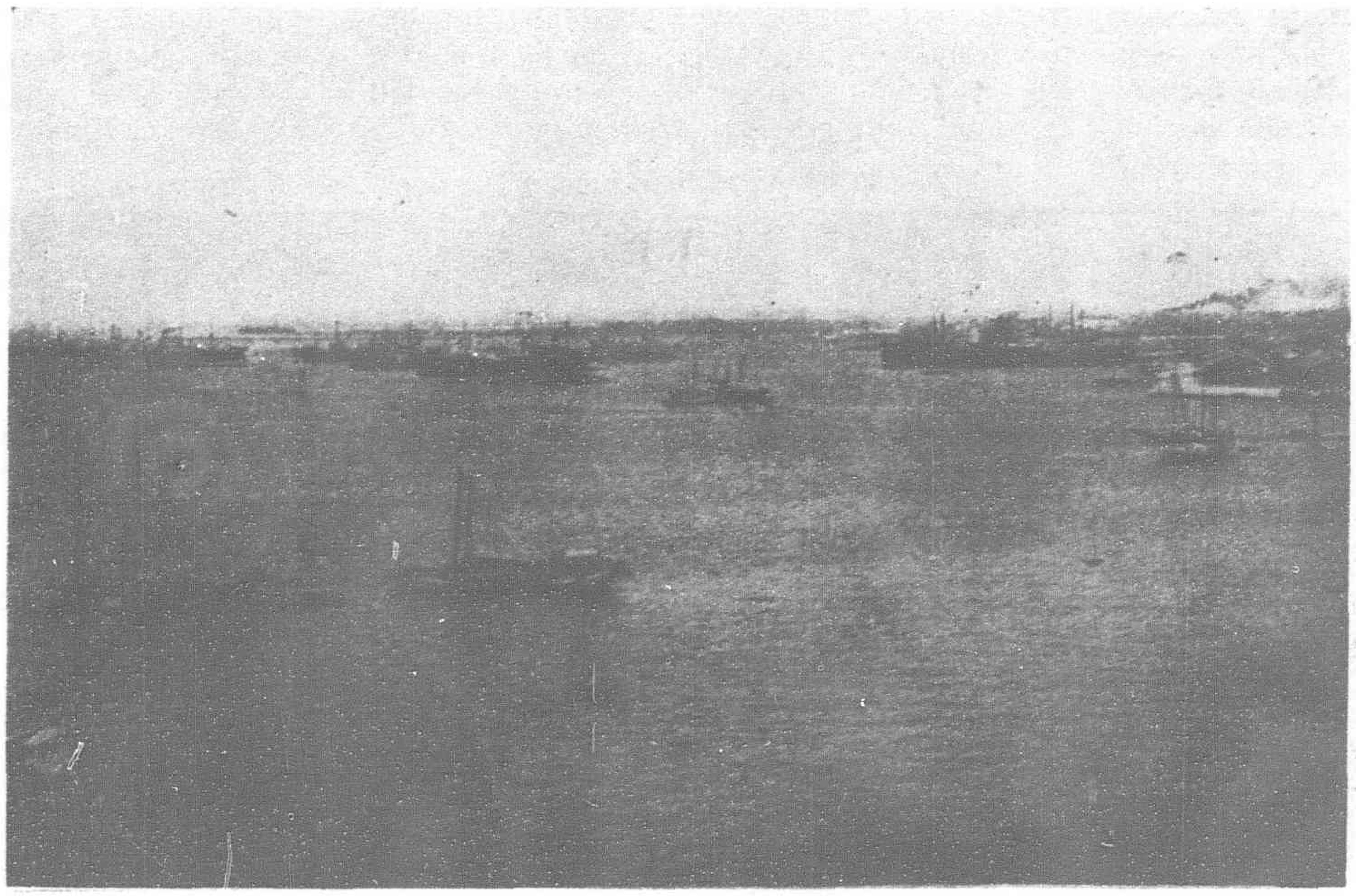
Since the remarkable progress made in industry and communications during the Meiji Era, the commerce of the city, has extended throughout the Empire. As a distributing and collecting point Nagoya has become known both at home and abroad, being placed just after Osaka and Tokyo. In reviewing the movement of goods a number of years ago, it is noticeable that most of the transportation was by land, and very little by water. But since the construction of Nagoya Harbor in 1907, the volume of goods shipped by water has greatly increased. Thus, at present, both land and sea transport is flourishing.

Commodities that are brought into the city are chiefly raw materials such as rice, sugar, lumber, coal, ginned cotton, iron, wool, etc. while those shipped out are mainly lumber, coal, cotton piece-goods, porcelain and pottery, beer, cement, and other refined or manufactured goods. The number of firms in the city that carry on business in the above-mentioned commodities consists of 1,239 joint-stock companies with an aggregate capital of Y107,478,000. When the firms that are not incorporated are added, the number is enormous.

Industries in Nagoya

From early times Nagoya has made remarkable progress, especially in industrial arts, on account of low wages, and the diligence and special skill in handicraft of the workers. Following the spirit of the times machinery has been introduced and factories have largely taken the place of household industries. The city is fortunate in having at its disposal an abundant supply of electric power. This fact, together with the facilities for transportation on land and sea, has made Nagoya the largest industrial center in Japan next to Osaka.

There are in the city 1,796 factories ordinarily employing more than five workers, and their annual output is valued at Y397,660,000.



A view of Nagoya harbor

Textile and dyeing industries head the list, including piece-goods, cotton yarns, knitted goods, silk yarns, floss-silk, etc. The chemical industry comes second, including porcelain and pottery, glassware, cement, chemicals, medical supplies, lacquer-ware and lacquered papier-mache-ware, and artificial manures. The food and drink industries are third, including alcoholic drinks, cakes and confectionery, flour, etc. Miscellaneous industries include wooden articles, paper goods, stationery, toys, leather goods, Buddhist family shrines, etc. The fifth industry is machinery, including weaving machines, pumps, vehicles, clocks, etc. Special industries include steel, castings, bronze, coal-gas, etc.

The industrial products of the city are exceedingly varied, which demonstrates that the city is favorably situated for the production of goods of every description, and that as an industrial city her future is assured.

Besides those mentioned there are a number of factories in the city producing arms, aeroplanes, and their accessories. Nagoya is the most important place in the production of aeroplanes in all Japan.

A word or two in regard to electric power may not be out of place here. As has been previously stated, there are in this part of Japan a number of rivers which are capable of producing an abundant supply of hydro-electric power. Thus, power can be had in sufficient quantity for all needs. This fact is contributing greatly to the development of industries in Nagoya. At present the electric power used in the city is being supplied by the Toho Electric Power Company. The water-power plants of this company in this district are capable of producing 62,000 kilowatts. Besides this the company buys 110,000 kilowatts from the Great Consolidated Electric Power Company, the Japan Electric Power Company, the Hakusan Waterpower Company, and the Yahag Waterpower Company. In addition, the Toho Electric Power Company has in the city a steam generating plant with a capacity of 83,000 kilowatts. The company supplies in Nagoya the following h.p. for the purposes shown :—

Motive Power

Textile Industries	19,613	h.p.
Electric Railways	13,492	,,
Iron Industries	8,450	,,
Lumber and Sawmills ..	6,416	,,
Kiln Industries	3,484	,,
Other Industries	18,039	,,
Total	69,494	,,

Electric Lights ..	717,702 bulbs	24,680 kwt.
Electric Heating	For Industries	15,680 kwt.
	For Homes ..	11,683 h.p.

In addition, the Toho Electric Power Company is installing water-power plants on the Hida and Tenryu rivers having a capacity of 420,000 h.p. and is thus endeavoring to increase the quantity of power available, so that this city will have a plentiful supply of electricity for industrial purposes in the future.

Hirokoji—The Broadway of Nagoya

Harbor and Foreign Trade

The port of Nagoya lies to the south-west within the city limits, and is situated at the northern extremity of Ise Bay, which opens to the south-west and is located between thirty-five degrees and thirty-five degrees five minutes North Latitude, and one hundred and thirty-six degrees forty minutes and one hundred and thirty-six degrees fifty-three minutes East Longitude. As Chita Peninsula stretches to the south-east, it is protected from the dreaded typhoons which come from that direction, and the port receives little damage from wind and wave. The heart of the city is closely connected with the port by the Horikawa, Shinhorikawa, and Nakagawa Canals, and the Rinko Railway Line.

The construction of Nagoya Harbor began in 1896. Since that time the third stage of the work was completed with an aggregate expenditure of Y15,490,000. The fourth stage of the construction was begun in 1928 at an estimate of Y10,120,000. This work was completed in 1933, when the area of the wharves was increased to 2.23 square kilometers, and the anchoring capacity to 262,000 tons for fifty-two steamers of ten thousand tons.

Nagoya Harbor is an important port of call for many lines. Trade with the American continents, Europe, China, the South Sea Islands, Australia, and Africa, is carried on directly from this port by twenty-six lines, such as the Seattle line, the line to the East Coast of South America, the Australian line, the Calcutta line, the Bombay line, and others of the Japan Mail Steamship Company (N.Y.K.), and the Australian line, the Calcutta line, the African line, and others of the Osaka Mercantile Steamship Co. (O.S.K.).

This port was opened to foreign trade in 1907, and, while its history is short, because of the fact that the harbor is within Nagoya City and is so convenient to important neighboring districts, domestic and foreign trade have developed by leaps and bounds since that time.

The Waterworks

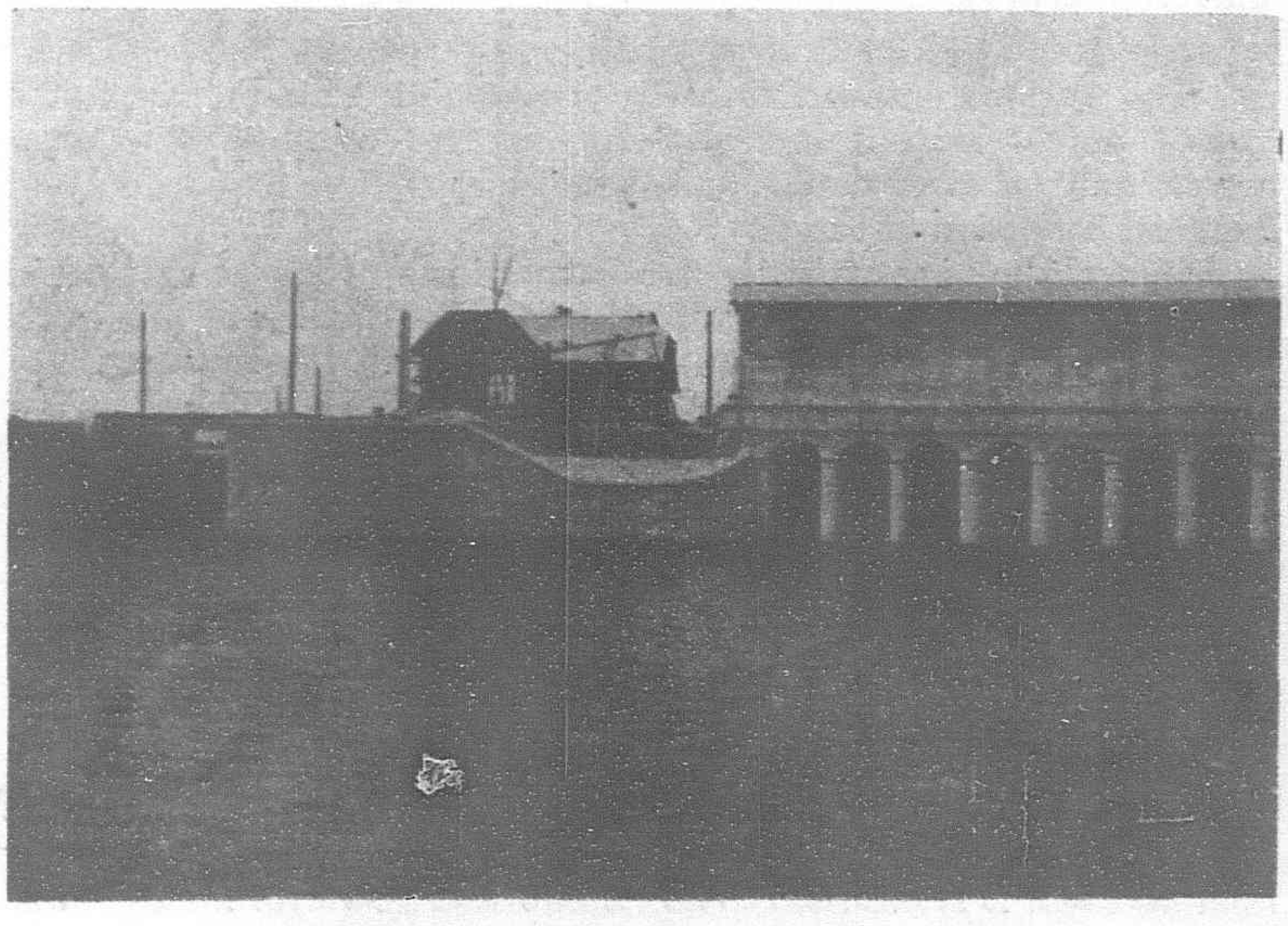
The Waterworks in Nagoya were begun in 1910, and since that time extensions have been made on several occasions. In 1928 17,239,850 cubic meters of water supplied to 83,837 houses. Having due regard to the future expansion of the city, plans are under way to enlarge the intake and water mains. When this work is completed the system will be able to supply water to two million people.

THE SEWAGE SYSTEM was commenced in 1907, and has already been extended several times. The area drained by the system is 27.69 square kilometers; the total length of sewers is about 510 kilometers; and ninety-five per cent of the houses on residential land are connected to the system.

With the rapid expansion of the western portion of the city it became necessary to put in trunk sewers. With a budget of Y2,300,000 the work was done. Unfortunately, the sewers that had been previously installed had no proper arrangements for discharging sewage but emptied into two of the canals. On this account the canals became very filthy, and were objectionable from the point of view of sanitation and navigation. In order to prevent river water from becoming polluted, and to prepare for the introduction of the water carriage system for houses and other buildings, extensive sewage disposal plants were planned at an estimated cost of Y1,900,000, and construction was completed in October 1930. Two plants were built, one at the end of Shinhorikawa, and the other at the neighborhood of the Atsuta Sewage Pumping Station. These plants are serving a total of 430,000 people, and are using the activated sludge process by diffused air for the purpose of purification. These plants will compare favorably with others of the same type in any part of the world.

There are in Nagoya twenty-eight public and private hospitals, while the number of doctors practising is about 1,200. The city authorities are making various sanitary arrangements for the public health and social welfare. For example, in order to prevent epidemics bounties are paid for rats, inoculations and vaccinations are given, and examinations are made to discover disease carriers, persons suffering from or suspected of having infectious diseases are confined in the Municipal Joto Hospital, a special hospital for

Tsurumai Park



Nakagawa canal lock and sluice gate

tubercular patients is maintained on the hills of Yagoto, where they are treated and cared for at a nominal payment. In addition there are eight clinics in the city for the treatment of trachoma. In order to give treatment to those who cannot afford to pay medical fees, four free, clinics are established. These are used by large numbers daily. To dispose of garbage and filth there are several incinerators, and the removal of night-soil is systematically done. Thus a real attempt is being made to keep the city clean and sanitary. There are Municipal Slaughter Houses with careful supervision. In connection with the cemetery and crematory, which are conducted by the city, there is a funeral hall for the convenience of the public. A Public Hospital constructed at the cost of a million yen, which has a capacity of 270 beds for the use of the sick and injured who are unable to defray the usual costs of medical attention.

City Planning

Nagoya has made remarkable progress as a commercial and industrial city, and is showing an exceptional rate of increase both in the number of houses and in population. City planning is now of the utmost importance as the growth has been rapid and disorderly. Nagoya is being reconstructed on uniform and systematic lines with due regard for communications, peace and order, sanitation, economics, commerce, and industry. The plan to create a Greater Nagoya includes the present city and five adjoining towns and villages with a total area of 162 square kilometers. With an eye to the future growth of the city this entire area is divided into various districts of which the industrial forms 32 per cent, the business ten per cent, the residential 55 per cent, and unallotted three per cent.

In regard to the system of main streets plans were made on two different occasions. According to these plans there are to be sixty main streets of various widths:—one street 43.6 meters wide, fourteen streets 32.7 meters wide, forty-four streets 24.5 meters wide, and one street 14.6 meters wide. The total length of these thoroughfares is 207,273 meters. They are to be newly constructed or re-constructed and widened.

There are two canals in the city at present, Horikawa and Shinhorikawa, but they are really inadequate to carry out their work of connecting the industries of Nagoya with the markets of the world. In 1926 a plan was made by which it was decided to complete the system of canals in order to do the work effectively. According to this plan the four rivers Nakagawa, Arakogawa, Yamazakigawa and Ohegawa, are to be deepened and widened from their mouths for an aggregate distance of 18 kilometers, north and east. These four rivers and the Horikawa will form five main arteries which will flow into the Nagoya Harbor.

At present there are only two parks in the city : one is Tsurumai Park with an area of 247,500 square meters, the other is Nakamura Park covering 31,350 square meters. As these parks are not sufficient to meet the demands of the citizens, not only are they to be expanded, but in the city and suburbs twenty-two other parks of various sizes will be laid out, according to the provisions of the city planning commission. The total area of these parks will be 5,527,830 square meters. The largest will be a natural park on Yagoto hills in the eastern part of the city with an area of 2,700,000 square meters.

The various enterprises of town planning already mentioned cannot be carried out immediately, but the work that is most urgent will be carried out first, according to the expansion and financial condition of the city.

One of the biggest items of construction which was completed in October 1930 is the Nakagawa Canal. The digging of this canal is an undertaking not common in this country. It has a length of 6,391 meters, a width of from 63.6 to 91 meters, and a depth at low tide of a little more than two meters. A strip of land 51 meters wide, on either side, was converted into landing stages, warehouse sites, and roads. Beyond these strips a further space 91 meters in width was filled in and prepared for factory sites. In order to connect with the railway near the new freight station a mooring basin for brages was constructed. A cross canal connecting with the Horikawa, which flows through the center of the city, has been built. The total expenditure for this canal was Y18,860,000. On the completion of the Nakagawa Canal which connects Nagoya Station and Nagoya Harbor, the two centers of transportation, by land and sea, it is needless to say a new and powerful impetus was given to the commerce and industry of this city.

Bascule Bridge Over the Sumida is Notable Engineering Project

(Continued from page 251)

leaves ; for under ordinary conditions 30 to 80 h.p. suffices to lift their weight. Direct instead of alternating current is employed due to its more effective results in hoisting cumbersome deadweight objects.

The main motor shaft and the main bascule bridge shaft are hooked up by gears having a 2340 : 1 ratio. The motors operate at a maximum speed of 500 r.p.m. from a current of 470 volts D.C. This current is supplied from two electrical generating units installed in the substation on the Tsukiji mainland to receive 3,300 volts of alternating current from two different sources through the Tokyo Municipal Electric Bureau, thus obviating any temporary shortage. The generating units consist of two 400 h.p. A.C. motors and two 250 kw. D.C. dynamos. The direct current generated operates the 125 h.p. D.C. motors on the mid-stream piers. Connection between the substation and the two piers is maintained by means of underwater cables. The main motor shafts are equipped with a series of brake appliances, of which there are solenoid, thruster and hand brakes.

Electric power is received at the substation from two sources in order that a temporary shortage from one source will not interfere with continual bridge operation. Should the supply from both sources ever fail at the same time, storage batteries kept in the substation for the purpose can be cut in automatically. After the lapse of a few minutes, in such an eventuality, gasoline motors will be started to generate the current required to replace that from the batteries.

Automatic Operation

Quarters for the bridge operator overlooking the channel approaches of the river are located on the Tsukiji-side pier. Both full automatic and semi-automatic operation for opening of the leaves, driving of the four lock-pin shafts and signalling for and against bridge traffic and river navagation are provided. Operating control buttons, switches and indicators, working only in definite sequence, are interlocked automatically as well as electrically. The movement of the two bascule leaves is self-adjustable for simultaneous operation.

A three-shift schedule for bridge attendants systematizes the operation, guarding, cleaning and the upkeep of the drawbridge. General maintenance expenses for power, illumination, etc., for the structure are expected to reach about fifty thousand yen annually.

Some two thousand meters upstream from the Kachidoki Drawbridge the Eitai Bridge spans the Sumida River. It was erected not long after the September, 1923, earthquake as one of the largest and most symmetrical of Tokyo's 5,194 bridges. South-east of the new drawbridge the island of Tsukishima covers an area of approximately 190 acres (or two million *tsubo*, one *tsubo* equalling 35.583 sq. ft.). Access to this island now from the downtown wards of Kyobashi and Nihonbashi is inconvenient, being possible only by ferry from the Tsukada and the Kachidoki crossings, or by a circuitous 20 minute motor-car detour by way of the Eitai Bridge. The drawbridge will consequently serve to facilitate connection to and from the reclaimed island tract.

Great Wall Power Plants

In order to supply the motive power for mines to be opened in the Great Wall region, Chinese, Japanese and Manchoukuo mining interests are planning the opening of large power plants near the wall.

It has been decided in principle to operate huge generators with hydraulic power derived from the Luanho, east of Tangshan, in the former demilitarized zone. The tentative plans include the opening of three power plants near the Great Wall, one at Lochiatun, another at Panchiakuo, south of Hsifengkou, and the third at Huanghuachuan, south of Jehol province.

Engineering Notes

INDUSTRIAL

NEW METAL PROCESS.—The Nagoya Municipal factory advisory office has applied for a patent on a new process for carburizing iron, following its successful use by the Mitsubishi Heavy Industries, Limited, the Aichi Clock and other companies. The agent developed by the Nagoya municipal technicians is expected to replenish diminishing stores of the old carburizing agent which used to be imported from America before the China incident. The Nagoya product is said to permeate iron to a depth of 2 to 5 millimeters, giving the surface the hardness of steel, and yet retaining the pliable quality of soft iron.

TEXTILE EXPORTS.—Textile imports from Japan during January reached the highest figure since February, 1938, despite the refusal of Chinese merchants to handle Japanese textiles, the Bureau of Customs announces. Japanese textiles imported by the Philippines in January of this year amounted to 2,953,451 square meters, 523,049 square meters above the amount imported in December, 1938. American textiles also registered a big increase. January imports of American textiles totalled $10,866,793 square meters, 1,381,816 square meters above the December figure and only below June 1938, as an all-time record, Bureau of Customs statistics revealed.

LARGE CHINESE ORDERS.—On behalf of the Hunang-Kwansi Railway, the Chinese Government Purchasing Commission in London has placed some large orders with British manufacturers.

Robert Hudson, Ltd., Leeds, will supply 650 steel side-tip wagons; Ruston and Hornsby, Ltd., Lincoln, 10 sets of centrifugal pumps and Diesel engines; and the Cargo Fleet Iron Co., Ltd., Middlesbrough, 60 tons of reinforcing steel.

Four sets of rock-cutting equipment and spares have been ordered from the Ingersoll Rand Co., Ltd., and 20 sets of hand-operated double-acting pumps from W. H. Wilcox & Co., Ltd., both of London.—*British Export Gazette.*

EXPLOIT TAKU HARBOR.—Plans for the construction of the largest commercial harbor in North China at Taku, at the mouth of the Peiho River near Tientsin, were launched in March with the projected establishment of a joint Sino-Japanese concern, capitalized at Y100,000,000 according to the *Asahi Shimbun* chain of newspapers.

A party of 30 experts from the Japanese Home Office are to leave for Tientsin early next month to make surveys required for construction of the harbor.

Opening of a harbor at Taku has been long discussed by various Powers, including Britain, France and America but no concrete plans were worked out by them because of considerable difficulty attending the dredging of the shallow mouth of the river at Taku.

AVIATION

AIRCRAFT PLANT.—French authorities have decided to erect an aircraft plant at Hanoi capable of producing 150 military planes and 400 engines annually. Work on the construction of the factory will commence shortly.

FIRST FLIGHT.—The China Aviation Corporation's transport aeroplane Beechcraft No. 37, which made a survey flight on February 22 from Chungking to Rangoon, left the latter city February 25 on its return flight to Chungking. It arrived at Kumming at 4 p.m. on February 26 and left at 9 a.m. for Chungking.

BERLIN-TOKYO LINE.—As a preliminary to the establishment of a regular airmail service between Berlin and Tokyo, via Bangkok, one of Germany's fastest Junker planes, under the auspices of the Reich Government, will shortly make a test flight of the territory. Official circles admit that the Japanese Government has authorized the flight, but will not divulge any further details.

PEIPING-DAIREN LINE.—The Chung Hua Aviation Corporation from March 1 started a daily round air service between Peiping and Dairen. Planes which formerly left Peiping for Dairen at 10 o'clock will advance their time of departure to 7.25 a.m., enabling them to leave Dairen on their return journey at 3.20 p.m. The re-arranged schedule will enable travellers to reach Tokyo, Changchun or Mukden in one day, because air services connecting these cities will also be run on revised time tables.

MANCHURIAN AIRPORTS.—To strengthen control over all airports, the Manchoukuo Government is planning construction of seven airports which will be attached directly to the Communications Department, reports the *Yomiuri*. New airfields will be built at Hsinking, Mukden, Harbin, Tsitsihar, Mutankiang, Chiamussu and Chengteh.

The Government has also decided, it is stated, to place the Manchoukuo Aviation Company, army airfields and land aeronautical facilities under its control.

CHUNGKING-HANOI LINE.—A direct Chungking-Hanoi air mail and passenger service was to be inaugurated on March 14, according to an official announcement by the Chinese Ministry of Communications. The plane to inaugurate the new service will make a stop at Kunming, arriving at Hanoi on the same day. A plane belonging to the China National Aviation Corporation made a survey flight on March 7 from Chungking to Hanoi, returning to Chungking on the following day. The new air line is to be established following the successful conclusion of negotiations between Air France and the Chinese Government.

JAPANESE AIR ROUTES.—The Ministry of Communications at Tokyo announces to-day that it would ask the Diet to vote Y10,000,000 for new international air routes between Tokyo and Changchun, and between Taihoku, in Formosa, and Canton.

A weekly service, it was stated, would be inaugurated by the Japan Aviation Corporation between Tokyo and Changchun, a distance of 1,550 kilometers. The service, the Ministry announces, will be started this June.

A daily service will be started between Taihoku and Canton, a distance of 920 kilometers, in October.

The Japan Aviation Corporation, a spokesman for the Ministry said, is already maintaining regular air services between Tokyo, Peiping and Nanking.

MINING

DUTCH OIL PRODUCTION.—According to the *Financial Times*, during 1938, the petroleum production of the Dutch East Indies was 7,398,585 metric tons, showing an increase of 136,582 metric tons as compared to the previous year.

OIL DISCOVERY.—Prospectors in Manchoukuo recently discovered a promising oil stratum near the Fushin Coal Mine, in Chinchow Province, says a report in the *Nikkan Kogyo*. Further discoveries in the district are expected, according to a recent statement in the Diet by Mr. Kunimichi Hara, vice-president of the Cabinet's Manchurian Affairs Bureau.

INDIAN IRON ORE.—The Yawata Steel Works, which accounts for four-fifths of Japan's pig-iron output and controls several mines in China, in the Federated Malay States and in the Philippine Islands, has contracted for additional ore supplies with producers in French Indo-China and in British India, the *Nikkan Kogyo Shimbun* reports. The British Indian contracts involve a total of 250,000 metric tons, which are being delivered to Japanese bottoms at Calcutta and Marmagao. The ore is a haematite of 60-70 per cent purity. It is noteworthy that this is the first Indian ore imported by Yawata. A shipment of 37,000 metric tons is expected shortly from French Indo-China.

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